THE OHIO JOURNAL OF SCIENCE

VOL. XXVIII MAY, 1928 No. 3

# REPORT OF THE THIRTY-EIGHTH ANNUAL MEETING OF THE OHIO ACADEMY OF SCIENCE

The Thirty-eighth Annual Meeting of the Ohio Academy of Science was held at the University of Cincinnati, Cincinnati. Ohio, on Friday and Saturday, April 6 and 7, 1928, under the presidency of Dr. Harris M. Benedict. Rarely if ever has a meeting of the Academy been held in a more congenial atmosphere or under happier conditions, thanks to the untiring, skillful efforts of President Benedict, who, at the risk of his own health, ably assisted by an efficient local committee, and cordially supported by the Mayor of the City, the President of the University of Cincinnati, the Cincinnati Chamber of Commerce, and Hotel Alms, seemed to have left nothing undone for the comfort and pleasure of the members of the Academy.

Among the special features provided for the entertainment of the visiting members may be mentioned free admission to the Cincinnati Art Museum, the famous Zoological Gardens, and, by special arrangements, the celebrated Taft Collection of Paintings; also permission to visit some of the larger factories where one might see the practical applications of science in industry; free transportation from Hotel Alms to the University and ample assistance in the matter of registration, information, etc., by courtesy of the Chamber of Commerce; a specially planned botanical field trip for Saturday afternoon under the skillful leadership of Dr. E. Lucy Braun, to the "Prairie Openings" at Miamiville and perhaps other points; a wealth of beautiful flowers from the Federated Garden Clubs of the city; and so on. It was indeed a joy and an inspiration to be there.

The banquet on Friday evening at Hotel Alms was undoubtedly the most largely attended and the most elaborate and beautiful in the history of the Academy to date. "And thereby

hangs a tale." The "secret" almost leaked out! Rumor has it that at about this time the students of one of the most popular and highly esteemed professors at the University of Cincinnati were casting about for some appropriate way of manifesting their love and loyalty for their teacher. Hence the banquet "extras!" Lucky O. A. S. members! Congratulations, Mr. President, and hearty thanks to your students!

The central theme of the meeting—if there was a central theme—was "The Relation of Physics to Biology," as emphasized by the notable lecture and presence of Dr. William T. Bovie of the Northwestern Medical College, Chicago, probably the foremost authority on certain phases of protoplasmic response to physical force, and by other lectures and papers by eminent scientists, such as President Schneider's talk on results attained at the Basic Research Laboratory of the University of Cincinnati, Doctor Allen's lecture on the use of the X-ray as a means of investigating the structure of protoplasm, Doctor Mathews on the coagulation of the blood, and Mr. Kelly on "Recent Researches in Audition," etc.

The general program of the meetings was as follows:

FRIDAY, APRIL 6.

9:00 A. M.—Business meeting.
10:00 A. M.—Scientific lectures and papers in general session.
1:30 P. M.—Scientific lectures and papers in sectional meetings.
6:30 P. M.—Banquet Hotel Alms. Remarks by Mayor Seasongood.
8:00 P. M.—Invitation address by Dr. William T. Bovie, Northwestern University, Chicago, on "The Relation of Physics to Biology."

SATURDAY, APRIL 7.

9:00 A. M.—Scientific lectures and papers in sectional meetings.
11:00 A. M.—Invitation lecture in general session by J. B. Kelly, of the Bell Telephone Laboratories, New York City, on "Recent Researches in Audition."
11:45 A. M.—Adjourned business meeting.

## MINUTES OF THE BUSINESS MEETINGS

The business meetings of the 38th Annual Meeting of the Ohio Academy of Science were held in the auditorium of McMicken Hall, University of Cincinnati.

The first meeting was held on Friday, April 6, 1928, and was called to order by President Benedict at 9:20 A. M. with about fifty members present.

The President announced the following committee appointments, viz.:

*Committee on Membership*—Charles H. Behre, Jr., E. Lucy Braun and Allyn C. Swinnerton.

*Committee on Resolutions*—L. B. Walton, Frederick C. Blake, and Emory R. Hayhurst.

*Committee on Necrology*—Herbert Osborn and A. E. Waller.

The reports of officers were then called for and the report of the Secretary and the report of the Treasurer were read, accepted and ordered filed.

The Academy then proceeded to the election of an *Auditing Committee* of two. Dr. A. Sophie Rogers and Dr. Frederick C. Blake were nominated and elected.

The reports of standing committees were then called for as follows: (a) The Executive Committee; report read by the Secretary. (b) The Publications Committee; oral report by E. L. Moseley. (c) The Trustees of the Research Fund; report read by the chairman, Dr. Herbert Osborn. (d) The Library Committee; the report of this committee was unusually elaborate and was presented by the chairman, Dr. F. O. Grover. An outstanding feature of this report was the presentation of a complete "List of Current Exchanges of The Ohio Academy of Science and The Ohio Journal of Science," prepared by Mrs. Ethel M. Miller. By a unanimous vote of the Academy it was decided to print in the Proceedings of this meeting a complete list of the current exchanges of The Ohio Academy of Science.

The President then called for the election by ballot of a nominating committee. The following were elected on said committee: L. B. Walton, J. H. Schaffner, A. C. Swinnerton, B. E. Neiswander, Samuel Renshaw, S. J. M. Allen.

At 10:10 A. M. the business meeting was adjourned to 11:45 A. M., Saturday, April 7, 1928, and the Academy went into general session, President Benedict presiding, to hear addresses and papers by President Herman Schneider, Dr. Samuel J. M. Allen, Dr. Albert P. Mathews and Mr. W. C. Devereaux.

The second business meeting was held as per adjournment on Saturday, April 7, 1928, and was called to order by President Benedict at 11:55 A. M.

The first item of business was the report of the Committee on State Parks and Conservation; the report was read by the Chairman, Dr. Herbert Osborn. Following the reading of this report, Doctor Osborn called the attention of the Academy to a Bill (H. R. 6091) introduced in the House of Representatives, 70th Congress, on December 7, 1927, by the Honorable John McSweeney, the preamble to which reads as follows:

A BILL

To insure adequate supplies of timber and other forest products for the people of the United States, to promote the full use of timber growing and other purposes of forest lands in the United States, including farm wood lots and those abandoned farm areas not suitable for agricultural production, and to secure the correlation and the most economical conduct of forest research in the Department of Agriculture through research in reforestation, timber growing, protection, utilization, forest economics, and related subjects, and for other purposes.

After some discussion it was moved by Dr. R. C. Osburn and seconded by several that The Ohio Academy of Science endorse the Bill as introduced. The motion was unanimously and heartily passed and the Secretary was instructed to advise Congressman McSweeney of this action at once.

The reports of special committees were then called for and made as follows: (a) The Committee on the Election of Fellows; this report was read by the Secretary and appears elsewhere in these Proceedings. (b) The report of the Nominating Committee; this report was read by the chairman, Prof. L. B. Walton and is printed elsewhere in these Proceedings. (c) The Committee on Membership; this report was presented by the Secretary and appears elsewhere. (d) The report of the Committee on Necrology; a preliminary report was made by the chairman, Dr. Herbert Osborn, with the statement that a more complete report would be submitted for publication in these Proceedings. (e) The report of the Auditing Committee was read by the chairman, Dr. A. Sophie Rogers and is printed elsewhere. (f) Report of the Committee on Resolutions; this report was presented by the chairman of the Committee, Professor Walton, and appears elsewhere in these Proceedings.

The reports of all committees, both standing and special, were accepted and ordered filed.

Under new and unfinished business, it was unanimously voted:

(1) That the proposed amendment to Chapter 1, Section 1, of the By-Laws, recommended by the Executive Committee, be approved.

(2) That Dr. Herbert Osborn be the delegate of the Ohio Academy of Science to the International Congress of Entomology at Cornell University, August 12–18, 1928.

(3) That the printing of the list of members in full be omitted from the printed Proceedings for the year 1928 and instead a list of the newly elected members, resignations, and deaths during the past year be printed.

(4) That the appointment of a representative to the Council of the American Association for the Advancement of Science be left with the Executive Committee with power.

(5) That the time and place of the annual meeting in 1929 be referred to the Executive Committee with power.

(6) That the list of applicants for membership endorsed by the Executive Committee and presented by the Secretary, be elected.

The meeting adjourned at 1:00 P. M.

## Reports

### *Report of the Secretary*

Cincinnati, Ohio, April 6, 1928.

*To the Ohio Academy of Science:*

The office of the Secretary has continued to function throughout the year and has earnestly tried to perform a useful, prompt service for the Academy and its 500 or more members, and in a broader way for all affiliated and co-operating orgnaizations of a similar character. While many members seem to have gotten along very nicely without making a single demand or request of the Secretary (fortunately for him, perhaps!), yet we are glad to report that the number of those willing to give the office a chance to serve them is on the increase.

As in other years, the first major task following the annual meeting of 1927 was the preparation of the proceedings and reports of the 37th Annual Meeting for publication. These appeared quite early in the summer as Part Two, Volume VIII, of the Proceedings of the Ohio Academy of Science. A brief summary of the meeting was also published in *Science* for May 27, 1927 (Vol. LXV, No. 1691). The 37th Annual Meeting was notable in that the attendance was large and an opportunity was given to hear two of the most distinguished scientists of the day, namely, Dr. Robert A. Millikan of the California Institute of Technology, and Dr. C. E. McClung, of the University of Pennsyl-

vania. The former discussed "Twentieth Century Discoveries in Physics," and the latter, "The Mechanism of Heredity." In addition to these two outstanding lectures, the members of the Academy prepared and presented some 81 papers on various topics; of these 81 papers, 10 were presented before the general sessions of the Academy, 11 before the section of Zoology, 19 before the section of Botany, 20 before the section of Geology, 11 before the section of Medical Science, and 10 before the section of Psychology. The section of the Physical Sciences and the Central Ohio Physics Club held two joint meetings, both of which were addressed by Doctor Millikan, the first on "The Birth of a Light Ray" and the second on "Relativity Inside an Atom."

In May of last year, under the fine leadership of Vice-President Swinnerton and Prof. Wilber Stout, some 45 members of the Section of Geology joined in a most interesting field trip into southern Ohio. Vice-President Swinnerton's report of this trip follows:

"The annual field trip of the geological section of the Ohio Academy of Science was conducted by Wilber Stout of the Ohio Geological Survey in the Portsmouth, Pomeroy region of southern Ohio on May 28, 29 and 30, with a registration of forty-five. The excursion was one of the most largely attended field trips in recent years of the section's activity.

"During the progress of the excursion, the party visited outcrops of the upper Waverlian Series of the upper Mississippian and the Pottsville, Conemaugh, and Monongahela Series of the Pennsylvanian, giving opportunity for both fossil collecting and stratigraphic study. The notable physiographic features of the region—the old Teays river valley, and other recently abandoned drainage systems, the upper Peneplain level, and the evidence for intermediate stages were examined by members of the party. Clay pits and mines were visited at Sciotoville, Scioto Furnace, and Oak Hill; near Jackson and Pomeroy, coal mines; and at Pomeroy, salt works. One of the most enjoyable features of the excursion was a starlight steamboat ride on the Ohio River at Pomeroy on the specially chartered 'Champion III.'

"Among the educational institutions represented were: Antioch College, Cincinnati University, Marietta College, Miami University, Muskingum College, Ohio Geological Survey, Ohio State University, Ohio Wesleyan University, and Toledo University.

A. C. SWINNERTON."

The Secretary represented the Academy at the Nashville meeting of the A. A. A. S. and was present at all the meetings of the Council, the latter part of December, 1927. In our report one year ago, mention was made of the temporary organization at the Philadelphia meeting of the A. A. A. S. in December, 1926, of the representatives of the affiliated academies. We now wish to report that a committee appointed by authority of this temporary organization, in co-operation with a committee appointed by the Executive Committee of the Council of the A. A. A. S., (Ward, Cattell, Livingston), the desirability of making such a meeting of the representatives of the affiliated academies a regular feature of the annual meetings of the A. A. A. S. was fully discussed during the year (1927) and the results are clearly stated in the following

letter from Dr. Burton E. Livingston, the Permanent Secretary of the A. A. A. S., to the Secretary:

WASHINGTON, D. C., January 12, 1928.

MR. WILLIAM H. ALEXANDER,
16 E. Broad St., Columbus, Ohio.

DEAR MR. ALEXANDER:

This note is to give you official information of the action on academy relations taken by the Council of the American Association at Nashville. There are two minutes, as follows, of December 28, 1927:

"3. On recommendation by the Executive Committee, the Council adopted the following resolution:

"*Resolved:* That it is desirable to have at the annual meeting each year a conference of the representatives of the academies of science, this conference to be arranged by the Executive Committee of the Association.

"4. On recommendation by the Executive Committee, the Council recorded its approval of the officers of the academy conference named by the conference Monday afternoon, December 26: Chairman, W. H. Alexander; Secretary, H. E. Enders."

I think we have now clearly started on a program that will greatly improve the organization of American scientists. We look forward to great developments. The academy conference can well become a very important feature of the annual meetings and throughout the year.

I take it that the conference consists now of the representatives of the Executive Committee of the Association (Ward, Cattell, Livingston). Others may be added, I assume, by vote of the conference and approval by the Executive Committee of the Association, but such a body is more effective if not too large, as you know. It has been suggested that the academies be urged to name as their representatives men who will be active; this should not be regarded as a mere honor. We want people who will care and work. It is suggested also that the academy secretary is often the most suitable man for this work. If he is not available, then a past secretary (or at least a past president who has shown active interest) should be named.

I hope the new organization will soon become active. Anything we can do here, as in sending out circular letters, etc., we shall be glad to do. If you and Doctor Enders will take up and carry on correspondence with the other members of the conference, I am sure things will begin to develop. Please keep me informed and let me help where I can.

Yours very sincerely,

BURTON E. LIVINGSTON,
*Permanent Secretary.*

In this connection and at this time it may be proper to point out the fact that it will be the privilege and duty of the Academy at this meeting either to elect, or authorize the Executive Committee to appoint, a representative of this Academy on the Council of the A. A. A. S. for the New York meeting next December. Bearing on this matter of council representation the following quotation from a letter under date of February 7, 1928, from the Permanent Secretary may be of interest to the members of the Academy:

DEAR MR. ALEXANDER:

Your organization is affiliated with the American Association and has representation in the Association council and also in one or more section committees; representatives in the council are ex-officio members of the section committee to which their scientific work is most closely related or to which they are assigned by organizations. These members of the section committees are of course supposed to function throughout the year (as called upon by section secretaries, for advice, etc.), but I wish to call your attention to the desirability of appointing representatives of your organization for 1928 who will probably be present at the New

York meeting and who will not be too busy with other things. While the secretary of an affiliated society is logically perhaps the best man to represent a society, yet he is frequently too busy during the meeting to attend properly to his duty as a representative, and he is sometimes not present at the meeting

BURTON E. LIVINGSTON.

The Academy received a very gracious invitation from The Board of Directors and The Faculty of the University of Toledo to be present at the inauguration of Dr. Henry John Doermann as President of the University on March 19, 1928. With the approval of President Benedict, Dr. H. H. M. Bowman, fellow in this Academy and a member of the Faculty of the University of Toledo, was requested to serve as the official delegate of the Ohio Academy of Science and he consented to do so. Doctor Bowman's report follows:

TOLEDO, OHIO, April 2, 1928.

*To The Ohio Academy of Science, William H. Alexander, Secretary, Columbus, Ohio:*

On March 19, 1928, it was the peculiar privilege of the undersigned to represent the Ohio Academy of Science as its delegate at the inauguration of President Henry John Doermann, of the University of the City of Toledo. He is herewith acknowledging the honor of his appointment by the President of The Ohio Academy of Science and also submitting a brief report of the exercises as requested by the Secretary of the Academy. The ceremonies were held in the Toledo Museum of Art at which were present about 120 delegates of the colleges and universities and learned societies of the United States which had been invited. Together with these was a great throng of alumni, students, faculty, trustees and distinguished citizens of Toledo. The chief address of the occasion was given by President C. C. Little of the University of Michigan and the oath of office was administered by Federal Judge John M. Killits. The pleasant weather and the colorful academic costumes of delegates and faculty made the procession in the Art Museum plaza a picturesque spectacle. A copy of the program is inclosed for the Academy files.

In conclusion your delegate thanks the Academy for the honor it has conferred upon him in naming him as its representative on this pleasant occasion.

Very respectfully,

H. H. M. BOWMAN.

The Secretary is pleased to present to the Academy three invitations to hold the annual meeting in 1929, namely, Ohio Wesleyan University, Delaware, Ohio State University, and the Columbus Chamber of Commerce, Columbus, and Wittenberg College, Springfield.

The Secretary wishes before closing this report to call the attention of the members of the Academy to the highly efficient services of Mrs. Ethel M. Miller, who is so graciously and effectively serving the Academy as its librarian, handling all exchanges, looking after the sale of academy publications, including the Ohio Journal of Science, etc. On March 6, 1928, Mrs. Miller reported cash on hand from the sale of publications and other sources "nearly $300.00, divided about evenly between the Academy and the Journal." Thus by her own diligent efforts she has provided the money with which to pay the expense of printing Special Paper No. 20 by Prof. E. L. Moseley.

The membership list continues to grow, rather slowly to be sure, but nevertheless the gains exceed the losses, and we have now slightly more than 500 members, of whom about one-fourth are fellows. As shown elsewhere in these proceedings we have secured 51 new members and two reinstatements during the year.

A note of condolence was sent to The Royal Academy of Madrid, Spain, on the death of its President, His Excellency, Senor D. Jose Rodriguez Carracido, on January 3, 1928.

The four-page leaflet entitled "The Ohio Academy of Science," was revised and a supply printed.

Respectfully submitted,

WILLIAM H. ALEXANDER, *Secretary.*

## *Treasurer's Report for the Year 1927–1928.*

RECEIPTS.

| | |
|---|---|
| Cash balance on hand April 1, 1927 | $ 491.34 |
| Interest on Federal Land Bank Certificate | 22.80 |
| Dues from members, back dues collected | 1,002.32 |
| Total Receipts, Exhibit A | $1,516.46 |

DISBURSEMENTS.

| | |
|---|---|
| The Ohio State University Press for bookplate for gifts to the Library | $ 4.00 |
| Schmitt Printing Co., 700 programs | 33.75 |
| W. H. Alexander, Secretary's honorarium | 100.00 |
| W. H. Alexander, Secretary's expenses for postage in connection with 1927 meeting | 26.29 |
| C. F. Wilson, Poster | 2.00 |
| W. G. Stover, postage, etc | 1.20 |
| Helen Coleman, stenographic services | 11.75 |
| Schmitt Printing Co | 8.56 |
| First-Citizens Corporation for accrued interest and balance of premium on hand Bank Certificate Purchase | 24.25 |
| Spahr & Glenn for printed statements | 3.50 |
| L. B. Walton, travel expense to attend Executive Committee meeting | 4.72 |
| Wm. H. Alexander, for secretary's expenses | 19.25 |
| Wm. H. Alexander, for secretary's expenses | 19.00 |
| Total Disbursements, Exhibit B | $258.21 |

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|---|---|
| Receipts | $1,516.46 |
| Disbursements | 258.21 |
| Cash balance on hand April 1, 1928 | $1,258.25 |

There are outstanding, however, several large items. Estimating these we have:

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|---|---|
| The Ohio Journal of Science for 1928 | $ 650.00 |
| Spahr & Glenn for three years Proceedings | 200.00 |
| Expenses of this meeting | 150.00 |
| Secretary's honorarium | 100.00 |
| Total | $1,100.00 |

or about $1,000 to be paid from the above balance. There are a few old accounts not yet collected and the allowance from the A. A. A. S. is payable during this spring. The treasury will therefore show a small but favorable balance. The money from the sale of publications is still being left in the hands of Mrs. Miller.

## *Report of the Executive Committee.*

CINCINNATI, OHIO, April 6, 1928.

*To the Ohio Academy of Science:*

The Executive Committee held two meetings during the year, one on January 21, 1928, at Columbus, and the other last evening at Hotel Alms, in Cincinnati, Ohio.

At the first of these meetings, four of the five members were present, and by invitation two of the Vice-Presidents. The following items of business were presented, discussed and agreed upon:

1. The resignation of Prof. Alpheus W. Smith from the office of Vice-President of the Section of Physical Sciences was accepted with regrets and Dr. Frederick C. Blake was unanimously elected to fill the vacancy.

2. The Treasurer and Secretary were appointed a committee of two to draft and present at the next annual meeting of the Academy an amendment to Chapter I, Section 1, of the By-Laws, making the payment of dues in advance necessary to election to membership in the Academy.

3. The invitation from the University of Cincinnati to hold the annual meeting for 1928 in Cincinnati was unanimously accepted, the exact date of the meeting to be determined by President Benedict after a conference with the university authorities.

4. The selection and securing of an invitation speaker was left in the hands of the President. The names of Dr. W. W. Lepeschkin and Dr. William T. Bovie were suggested.

5. It was unanimously agreed that an invitation be extended through the President to the members of the Indiana and the Kentucky Academies of Science to attend our meeting in Cincinnati and present papers.

6. It was also voted to extend an invitation to the Natural History Club of the Ohio State University to make an exhibit of its rare collection of photographs, drawings, collections, etc.

7. Nine applications for membership in the Academy were unanimously approved.

8. The appointment by the President of Dr. Herbert Osborn, Dr. E. Lucy Braun and Mr. Arthur R. Harper as a sub-committee of the Standing Committee on State Parks and Conservation to co-operate with the State Forester in the formulation of rules and regulations for the protection of plant and animal life of the State Forests was announced.

9. The appointment of one or more delegates to the International Congress of Entomology to be held at Cornell University, Ithaca, N. Y., August 12–18, 1928, was left with the President and the Vice-President of the Section of Zoology.

At the second meeting of the Committee it was voted:

1. That the Executive Committee recommend to the Academy the consideration of the advisability of changing the date of the annual meeting to the last Friday and Saturday in February.

2. That the list of members be omitted from the published proceedings for the year 1928, and instead only the names of the new members, those who have resigned and those who have died during the past year.

3. That the fifty-one persons whose applications for membership in the Academy are on file with the Secretary be recommended for election to membership.

4. That the secretary be requested to secure further information relative to the problem of increased facilities for the encouragement of junior scientific effort and submit same with recommendation at the next meeting of the executive committee.

Respectfully submitted,

THE EXECUTIVE COMMITTEE,
By WM. H. ALEXANDER, *Secretary.*

Report accepted and ordered filed.

## *Report of the Trustees of the Research Fund.*

CINCINNATI, OHIO, April 7, 1928.

*To the Ohio Academy of Science:*

The additions to the research fund for the year, the balance of which was $120.41, have been: interest to the amount of $2.50 on June 3, and $48.00 on November 1, making a bank balance subject to check of $170.91. This, less $50.00 grant to Mr. B. G. Meyers, leaves a present bank balance of $120.91. Interest due this month will give us a bank balance of $170.91. Unless grants are made during the next three months it would seem advisable to deposit $100.00, which would increase our interest-bearing fund to $1500.00. At present our invested funds are: bonds $1300.00, certificate of deposit $100.00; total $1400.00

SUMMARY.

| | |
|---|---|
| Balance from last year | $120.41 |
| Interest additions | 50.50 |
| Total | $170.91 |
| Grant to Mr. Meyers | 50.00 |
| Balance subject to check | $120.91 |

Further funds due will permit grants during the year and the trustees will be pleased to receive suggestions as to the desirable use of the available amount.

Vouchers and certificate of invested funds are respectfully submitted.

HERBERT OSBORN, *Chairman,*
*For the Trustees.*

*Report of the Auditing Committee.*

CINCINNATI, OHIO, April 7, 1928.

*To the Ohio Academy of Science:*

The Auditing Committee has examined the books of the Treasurer of the Academy for the years 1927 and 1928 and of the Trustees of the Research Fund for the year 1928, and find all accounts correct and all vouchers accounted for.

A. SOPHIE ROGERS, *Chairman,*
F. C. BLAKE,
*Committee.*

*Report of the Committee on State Parks and Conservation.*

CINCINNATI, OHIO, April 7, 1928.

*To the Ohio Academy of Science:*

The Committee feels that the matter of particular importance at present is the formulation of provisions for the care of the State Forests and Game Reserves, which, as announced yesterday, has been referred to a sub-committee to work with the authorities in charge of these tracts. We are encouraged by the interest in park and bird refuges, by different societies and individuals, and especially commend the efforts of the *Wild Flower Preservation Society* in its endeavors to secure greater protection to our native flora. We urge members of the Academy to work in their respective communities through schools, boy scouts, women's clubs, etc., and urge them to develop sentiment for the preservation of native fauna and flora.

Respectfully submitted,

HERBERT OSBORN, *Chairman,*
EMERY R. HAYHURST,
E. LUCY BRAUN,
E. L. FULLMER,
*For the Committee.*

*Report of the Library Committee.*

CINCINNATI, OHIO, April 6, 1928.

*To the Ohio Academy of Science:*

The allocation of exchanges among the Ohio Academy of Science, the Ohio Journal of Science and the Ohio State University Library has now been completed, the proper recognitions have been made by the Library, bookplates have been inserted in Ohio Academy volumes, and a card record has been prepared by the Accession Librarian for her files. Proper credit for future accessions will thus be assured. The utmost credit should be given to Mrs. Ethel M. Miller of the Botany-Zoology Library of the University for the completion of this important work.

The Committee recommends that the list of current exchanges received by the Academy be published in the next issue of the Proceedings.

One hundred and nineteen Academy publications have been sold to fifty-one individuals and institutions during the year. A statement of these sales is included in Mrs. Miller's appended report. The Chairman of the Committee has checked these sales and audited Mrs. Miller's books, and finds her accounts to be correct and her books to balance. The Committee urges the importance of a constant output of publications by the Academy. It believes that there should be at least one publication a year. The Committee recommends that the Academy approve the policy of financing one such publication each year.

Respectfully submitted,

F. O. Grover, *Chairman*,
F. C. Blake,
E. L. Moseley.

## *Report of Mrs. Miller for the Ohio State Univesrity Library.*

Columbus, Ohio, April 5, 1928.

*To the Ohio Academy of Science:*

The sales of the various publications of the Academy for the past year have amounted to $63.70. As the Treasurer of the Academy has allowed all sums accruing from sales since April, 1926, to remain on deposit, the bank balance is now $156.13.

The Proceedings of the Thirty-seventh Annual Meeting were received early in August and were mailed at once to 481 members, 90 exchanges and to 4 libraries which maintain standing orders for the publications of the Academy. This was an increase over last year of six exchanges and two standing orders.

The card catalog of the exchanges of the Ohio Academy of Science and the Ohio Journal of Science has been deposited in the Ohio State University Library. The Accession Department of the Library has also made a card for each exchange and these cards have been filed in the regular Order File in that Department. It is thought that this will eliminate the difficulties encountered heretofore in assigning the correct sources to the various books and periodicals which come as exchanges. It also gives the Accession Department a more complete record of the publications which come to the Library. Duplication of orders and exchanges will thus be avoided.

The card catalog shows what is sent from here for each exchange, whether Academy publications or the Ohio Journal of Science, the date and the volume with which each side began the exchange. In some cases, especially the foreign exchanges, it has not been possible to learn exactly the date of the beginning of the exchange, when it was before 1916. By far the larger number of the exchanges which have been secured was due to the untiring efforts of Mr. Reeder when he was

connected with the University Library. He placed the exchange work upon a firm basis, and any work which has been done since he left the Library has been built upon the foundation which he laid.

In addition to the cards in the Order File and in the card catalog a list has been made of all the exchanges which come currently. This list is arranged geographically and shows a number of interesting things, especially that there are some large cities and some important countries where there is not a single set of the Ohio Academy of Science Proceedings to be found. This condition will likely exist as long as the Academy does not publish something regularly.

I am exceedingly glad that the publication of the Special Papers has been resumed. I greatly hope that from now on at least one such paper may be published each year. If the members will only furnish the papers, the sales of the publications can be expected to supply nearly half the amount needed for printing them, thus leaving not an excessive amount to be paid from the regular funds of the Academy. Then more exchanges can be secured, more sales can be made and what is most important of all, the publications of the Ohio Academy of Science will compare more favorably with those of other Academies and learned Societies at home and abroad.

Very respectfully yours,

ETHEL M. MILLER.

## LIST OF CURRENT EXCHANGES OF THE OHIO ACADEMY OF SCIENCE

Deposited in the Ohio State University Library.

Prepared by MRS. ETHEL M. MILLER.

(Exchanges marked with an asterisk (*) belong to both The Ohio Academy of Science and the Ohio Journal of Science.)

ARGENTINA

Buenos Aires. Museo nacional de historia natural (*)
Anales
Sociedad científica argentina (*)
Anales
Books

AUSTRALIA

Brisbane. Queensland agricultural journal (*)

AUSTRIA

Vienna. Naturhistorisches staatsmuseum (*)
Annalen
Zoologisch-botanische gesellschaft(*)
Abhandlungen
Verhandlungen

BELGIUM

Brussels. Académie royale des sciences, des lettres et des beaux-arts de Belgique (*)
Annuaire
Bulletins

BRAZIL

Sao Paulo. Museu paulista
Revista

CANADA

Ottawa. Geological survey. (*)
Annual report
Bulletin
Quebec. Quebec society for the protection of plants
Report
Toronto. University (*)
Canadian historical review
Studies

DENMARK

Copenhagen. Danske videnskabernes selskab (*)
Biologiske meddelelser
Oversigt

ENGLAND

London. British museum (Natural history)
Books
Guides
Insects of Samoa

FINLAND

Helsingfors. Finska vetenskaps-societeten (*)
Acta societatis scientiarum fennicae
Arsbok-vuosikirja
Bidrag till kännedom af Finlands natur och folk
Commentationes biologicae
Commentationes humanarum litterarum
Commentationes physico-mathematicae
Societas pro fauna et flora fennica(*)
Acta
Acta botanica fennica
Acta zoologica fennica
Memoranda

FRANCE

Macon. Académie de Mâcon (*)
Annales
Vesoul. Société d'agriculture, lettres, sciences et arts du département de la Haute-Saône (*)
Bulletin

GERMANY

Berlin. Universität. K. Zoologisches museum.
Mitteilungen
Berlin-Dahlem. Germany. Biologische reichsanstalt für land- und forstwirtschaft (*)
Bibliographie der pflanzenschutzliteratur
Flugblatt
Nachrichtenblatt
Amtliche pflanzenschutzbestimmungen
Bremen. Bremer wissenschaftliche gesellschaft (*)
Abhandlungen und vorträge
Books
Niederdeutsche zeitschrift für volkskunde
Frankfurt a M. Senckenbergische naturforschende gesellschaft, Frankfurt am Main (*)
Bericht
Senckenbergiana
Stuttgart. Verein für vaterländische naturkunde in Württemberg (*)
Jahreshefte

HAWAII

Honolulu. Hawaiian entomological society (*)
Proceedings

INDIA

Madras. Madras. Fisheries bureau
Bulletin

JAPAN

Sendai. Saito ho-on kai (Saito gratitude foundation) (*)
Annual report
Monographs

MEXICO

Mexico. Boletín oficial de la Secretaria de agricultura y fomento (*)
Dirección de estudios biológicos (*)
Boletín
Books

NORWAY

Tromso. Tromso museum (*)
Aarsberetning
Aarshefter

PERU

Lima. Sociedad geográfica de Lima (*)
Boletín
Universidad mayor de San Marcos
Anales de la Facultad de ciencias
Boletin bibliografico
Revista universitaria

PORTUGAL

Coimbra. Sociedade broteriana
Boletim

SOUTH AFRICA

Kirstenbosch. Botanical society of South Africa (*)
Journal
Report of National botanic gardens
Pretoria. South Africa. Department of agriculture (*)
Bothalia
Journal
Publications, Division of botany, entomology

SPAIN

Barcelona. R. Academia de ciencias y artes (*)
Memorias
Boletín
Club muntanyenc
Butlletí
Madrid. Museo nacional de ciencias naturales (*)
Trabajos. Botánica, geológica, zoológica series

Flora iberica
Genera mammalium

SWEDEN

Upsala. Universitet. Mineralogisk-geologiska institut (*)
Bulletin

UGANDA

Nairobi. East Africa and Uganda natural history society (*)
Journal

UNION OF SOCIALISTIC SOVIET REPUBLICS

Tashkent. Université de l'Asie centrale (*)
Bulletin

## UNITED STATES

ARIZONA

Flagstaff. Lowell observatory
Bulletin

CALIFORNIA

Berkeley. California. University (*)
Publications. Agricultural sciences, botany, geological sciences, zoology
Claremont. Journal of entomology and zoology (*)
San Diego. San Diego society of natural history (*)
Annual Report
Transactions
San Francisco. California academy of sciences (*)
Occasional papers
Proceedings
Terminal Island. California fish and game commission. State fisheries laboratory.
Bulletin
Contributions
Report

COLORADO

Colorado Springs. Colorado college (*)
Publications. Language, science, social science series

CONNECTICUT

Hartford. Connecticut. State geological and natural history survey (*)
Bulletin
New Haven. Connecticut academy of arts and sciences
Memoirs
Transactions

DISTRICT OF COLUMBIA

Washington. U. S. Department of agriculture (*)
Bulletin
U. S. Geological Survey (*)
Bulletin
Professional papers
Water-supply papers

ILLINOIS

Chicago. Chicago academy of sciences
Natural history survey bulletin
Field musuem of natural history (*)
Publications
Anthropological, botanical, geological, report, zoological series
Leaflets
Anthropology, botany, geology, zoology departments
Rock Island. Augustana college and theological seminary
Augustana library publications
Urbana. Illinois. Natural history survey (*)
Bulletin
Illinois. University (*)
Illinois biological monographs
Studies in language and literature

INDIANA

Brookville. Indiana academy of science
Proceedings

IOWA

Davenport. Davenport academy of sciences (*)
Proceedings
Des Moines. Iowa academy of sciences
Proceedings
Sioux City. Wilson bulletin (*)

KENTUCKY

Lexington. Kentucky academy of science
Transactions

MASSACHUSETTS

Cambridge. Harvard university. Bussey institution
Laboratory of entomology
Contributions
Harvard university. Gray herbarium (*)
Contributions
Memoirs
Woods Hole. Marine biological laboratory (*)
Report

MICHIGAN

Ann Arbor. Michigan academy of science, arts and letters
Papers

MINNESOTA

Minneapolis. Minnesota. University (*)
Studies in the biological sciences

MISSISSIPPI

University. Mississippi geological survey
Publications

MISSOURI

Columbia. Missouri. University (*)
Studies
Missouri. University. Observatory
Publications
St. Louis. Academy of science of St. Louis (*)
Transactions
Missouri botanical garden (*)
Annals

NEBRASKA

Lincoln. Nebraska academy of sciences
Publications

NEW JERSEY

Princeton. Princeton university
Contributions from the biological laboratories

NEW YORK

Brooklyn. Brooklyn institute of arts and sciences
Botanic garden (*)
Contributions
Leaflets
Memoirs
Record
Museum (*)
Report
Science Bulletin
Buffalo. Buffalo society of natural sciences
Bulletin
New York. American museum of natural history
Books
New York academy of sciences (*)
Annals
New York botanical garden (*)
Bulletin
Rochester. Rochester academy of science (*)
Proceedings

OHIO

Cincinnati. University
Studies
Cincinnati. Lloyd library of botany, pharmacy and materia medica (*)
Bulletin
Granville. Denison university
Scientific laboratories
Journal
Oberlin. Oberlin college (*)
Laboratory bulletin

OKLAHOMA

Norman. Oklahoma academy of science
Proceedings

PENNSYLVANIA

Philadelphia. Academy of natural sciences of Philadelphia (*)
Entomological news
Proceedings
Year book
Wagner free institute of science of Philadelphia (*)
Bulletin
Transactions
Warren. Warren academy of sciences
Transactions

SOUTH CAROLINA

Charleston. Charleston museum (*)
Contributions
Quarterly

SOUTH DAKOTA

Vermillion. South Dakota academy of sciences
Proceedings

UTAH

Salt Lake City. Utah academy of sciences
Transactions

VIRGINIA

Richmond. Virginia academy of science
Proceedings

WASHINGTON

Seattle. Washington (State) University. Puget Sound biological station (*)
Publications

WISCONSIN

Madison. Wisconsin academy of sciences, arts and letters (*)
Transactions
Milwaukee. Public museum (*)
Bulletin
Year book

*Report of the Committee on the Election of Fellows.*

CINCINNATI, OHIO, April 6, 1928.

*To the Ohio Academy of Science:*

A meeting of the Committee on the Election of Fellows was held at Hotel Alms, Cincinnati, Ohio, on the evening of April 5, 1928, with a quorum of the Committee present, President Benedict presiding. Of the candidates nominated, six received the required number of favorable votes and were declared elected. In accordance with custom, the newly elected fellows will be personally notified, and their names will be published in the proceedings of this meeting.

WM. H. ALEXANDER, *Secretary,*
*For the Committee.*

The following is a complete list of those elected Fellows in the Ohio Academy of Science, viz.:

CHARLES HENRY BEHRE, JR.
FRED ANDREWS HITCHCOCK
ROBERT ALLAN MOORE
KATHARINE DOORIS SHARP
JOHN PAUL VISSCHER
FRANK J. WRIGHT

*Report of the Nominating Committee.*

CINCINNATI, OHIO, April 7, 1928.

*To the Ohio Academy of Science:*

Your Committee respectfully submits the following nominations for the offices mentioned, for the ensuing year:

*President*—JAMES S. HINE.
*Vice-Presidents:*
*Zoology*—ANNETTE BRAUN.
*Botany*—E. LUCY BRAUN.
*Geology*—CHARLES H. BEHRE, JR.
*Medical Science*—ALBERT P. MATHEWS.
*Psychology*—SAMUEL RENSHAW.
*Physical Sciences*—E. H. Johnson
*Secretary*—WILLIAM H. ALEXANDER.
*Treasurer*—A. E. WALLER.
*Elective Members of the Executive Committee*—R. C. OSBURN, STEPHEN R. WILLIAMS.
*Trustee, Research Fund*—GEORGE D. HUBBARD.
*Publications Committee*—F. O. GROVER, FREDERICK C. BLAKE, E. L. MOSELEY.
*Library Committee*—E. L. MOSELEY.
*Committee on State Parks and Conservation*—HERBERT OSBORN, ARTHUR R. HARPER, CONRAD ROTH.

L. B. WALTON, *Chairman,*
JOHN H. SCHAFFNER,
B. E. NEISWANDER,
ALLYN C. SWINNERTON,
S. J. M. ALLEN,
*Committee.*

Upon motion, the Secretary was instructed to cast the unanimous vote of the Academy for the above nominees which was done and they were declared elected.

*Report of the Committee on Necrology.*

CINCINNATI, OHIO, April 7, 1928.

*To the Ohio Academy of Science:*

During the past year the hand of death has fallen heavily on our Academy, since six of our eminent and beloved members have been called from our association. It is especially fitting that we give place in our proceedings to pay tribute to them and to express our sympathy to the families and friends of these departed comrades.

PROFESSOR BRUCE FINK.

Professor Bruce Fink, one of our most distinguished members and a Past President, died suddenly on July 10, 1927. He was born December 22, 1861, at Blackberry, Ill. He was educated in University of Illinois (B. S. 1894), Harvard (A. M., 1896) and University of Minnesota, (Ph. D., 1899). He was professor of botany at Upper Iowa University in 1902-03, professor of botany at Grinnell College from 1903 to 1906, when he came to Miami University. He was a member of Sigma Xi Research Fraternity; Fellow of the American Research Association for the Advancement of Science; member of the Society of Naturalists; member of the Society of Botanists of the Central States; Fellow of the Botanical Society of America; and member of the International Society of Botanists and Past President of the Iowa Academy of Sciences. He joined our Academy in 1906 and was President for the year 1912. He was an international authority on lichens, doubtless the leading one in America, if not in the world, and the author of many books and papers.

PROFESSOR WILLIAM CORLESS MILLS.

Professor Mills was born in Pyrmont, Ohio, January 2, 1860, and died January 17, 1928. He entered Ohio State University in 1881 but later studied in the Cincinnati School of Pharmacy, graduating in 1885. In 1897 he returned to Ohio State and received the Degree of Bachelor of Science in Agriculture in 1898 and the Master's degree in 1902. In 1898 he was made curator and librarian of the Ohio Archaeological and Historical Society and in October, 1921, he was made Director of the Museum, a position occupied until his death. He joined the Academy in 1898 and was elected a Fellow in 1920 and served as Chairman of the Library Committee from 1916 to 1924.

Professor Mills was a man of very genial character and had a host of friends throughout the state and among the archaeologists of the country. He was an ardent and very successful collector especially of the Indian relics of the Ohio Mounds and has published many papers upon this subject. He was expert in the preparation and exhibition of material and the Archaeological Museum is a permanent tribute to his skill.

PROFESSOR GEORGE H. COLTON.

Professor Colton was born in Nelson, Portage County, Ohio, on October 10, 1848, and died June 4, 1927. He graduated from Hiram College in 1871. He taught a wide range of subjects: Geology, Physics, Chemistry, Physical Geography, Biology, Anatomy, Zoology, Physiology, and perhaps other subjects. He joined the Academy in 1892 very soon after its organization and maintained his membership throughout the remaining years of his life.

JOHN W. SCHAEFFER.

Mr. John W. Schaeffer, of the Columbus Weather Bureau Station, died suddenly on October 10, 1927. He was born March 18, 1858, at Troy, Ohio. Mr. Schaeffer enlisted in the Signal Corps on October 24, 1887, and served continuously, his longer assignments being Des Moines, Milwaukee, Ithaca and Columbus. His service in the last-named place totaled nearly 18 years. He joined the Academy in 1927.

EBEN HUTCHISON EMERY.

Mr. Emery was born in Athens, Maine, on December 8, 1860, and died March 12, 1928. He entered the United States Weather Bureau 44 years ago and was eminent in the service, holding the important position of chief of the Cleveland Station since 1916. He has been a member of the Academy since 1921.

RALPH LUSK.

Mr. Ralph Lusk was born in Manchester, Iowa, July 14, 1896, and died July, 1927. He received the degree of Bachelor of Science from Denison University in 1922 and attended Chicago University 1922-'23 and served as Field Assistant of the United States Geological Survey 1922-'23 and as Junior Geologist in 1924. He was an instructor of Geology in Denison University in 1923-'24, and Assistant in Geology at Harvard University for 1924-'25, Austin teaching fellow 1925-'26, instructor in 1926-'27. He also served as Field Geologist on the Tennessee Geological Survey in 1925-'26. He became a member of the Ohio Academy of Science in 1924.

JACOB LOWELL ROUDEBUSH.

Mr. Roudebush was born March 6, 1852, and died December 11, 1926. He attended Holbrook Normal School at Lebanon, largely self-taught, and was an enthusiastic agriculturalist, delivering many lectures on agricultural chemistry, soil fertility and entomology. He was a distinguished citizen of Clermont County, fearless in action, forceful as a speaker, up-to-date as a farmer, scholar and student. Mr. Roudebush joined the Ohio Academy of Science in 1900, was a member of the State Horticultural Society, and a fellow in the National Geographic Society.

We recommend that this memorial notice be incorporated in the minutes of the Society and published in the Proceedings.

HERBERT OSBORN,
ADOLPH E. WALLER,
*Committee.*

## *Report of the Committee on Resolutions.*

CINCINNATI, OHIO, April 7, 1928.

The Ohio Academy of Science wishes to express its hearty appreciation to the following organizations and individuals for the co-operation which has made the thirty-eighth annual meeting one of the most enjoyable assemblages of the Academy:

1. To the members of the Local Committee whose responsibility has been that of the general arrangements.
2. To the Cincinnati Chamber of Commerce for the excellent provisions made in connection with registration and transportation and for the young ladies who rendered such helpful assistance.
3. To the authorities of the University of Cincinnati for the use of its buildings and equipment.
4. To the Federated Garden Clubs of Cincinnati for the floral decorations so generously supplied for the banquet tables and through which their cordiality to the Academy was so beautifully expressed.
5. To the management of Hotel Alms for various courtesies so cordially extended.
6. To Dr. William T. Bovie, of Northwestern University, and to Mr. J. B. Kelly, of the Bell Telephone Laboratories of New York, for the educational entertainment afforded by their lectures.
7. To Dr. A. E. Waller, Mr. Robert B. Gordon, Mr. Arthur R. Harper, Mr. Edward S. Thomas and Mr. Roscoe W. Frank for the interesting exhibit of natural history, photographs, etc.
8. And particularly to our President, Dr. Harris M. Benedict, for his most successful efforts in providing for the comfort of the members and the welfare of the Academy.

Respectfully submitted,

L. B. WALTON, *Chairman*,
F. C. BLAKE,
EMERY R. HAYHURST,
*Committee.*

Report unanimously approved.

## *List of Withdrawals.*

| | |
|---|---|
| AINSLIE, GEORGE G. | Knoxville, Tenn. |
| ARNOLD, H. J. | Springfield |
| BEAM, J. ALBERT | Tiffin |
| BEARSS, ESTHER | Sulphur Springs, Fla. |
| BOHSTEDT, G. | Wooster |
| BUSCH, K. G. A. | Columbus |
| CAMP, MRS. JEAN TURNER | Westerville |
| CAMPBELL, EVA G. | Guilford College, N. C. |
| CASKEY, M. W. | Louisville, Ky. |
| EASTERLING, G. R. | Athens |
| ELIOT, THEODORE S. | Cleveland |
| FEARING, FRANKLIN | Delaware |
| FORDYCE, GEORGE L. | Youngstown |
| GILMORE, GRACE | Wooster |
| HANSEN, WALTER | Oberlin |

HARP, HUGH G.....Springfield
HURST, MACLEOD E.....Columbus
JOHNSTON, WILLIAM D.....Socorro, N. M.
JONES, EDWARD S.....Buffalo, N. Y.
KUECHLE, THEODORE FRED.....Columbus
MADISON, HAROLD L.....Cleveland
MORE, LOUIS T.....Cincinnati
PETTIJOHN, FRANCIS J.....St. Paul, Minn.
SCHRADIECK, JACOB E.....Baltimore, Md.
SETTERFIELD, HUGH.....Columbus
SOUTH, EARL B.....Albany, N. Y.
TRIESCHMANN, JACOB E.....Evanston, Ill.
TUTTLE, W. W.....Iowa City, Ia.
UNNEWEHR, EMORY C.....St. Paul, Minn.
YOUNG, R. A.....Gainesville, Fla.

## *List of Deceased Members.*

COLTON, GEORGE H.....Hiram
EMERY, E. H.....Cleveland
FINK, BRUCE.....Oxford
LUSK, RALPH G.....Granville
MILLS, W. C.....Columbus
ROUDEBUSH, LOWELL.....New Richmond
SCHAEFFER, JOHN W.....Columbus

## *List of New Members.*

The following is a list of the persons whose applications for membership in the Academy were favorably passed upon by the Executive Committee or the Membership Committee and whose election to membership was unanimously approved by the Academy:

ARGO, VIRGIL N., Department of Entomology, O. S. U., Columbus. (Entomology).
*AUTEN, (MISS) MARY, Ohio Northern University, Ada. (Zoology; Entomology; Botany).
AYRES, DR. WYLIE MCL., The Groton Bldg., Seventh and Race Sts., Cincinnati. (Botany; Medical Sciences).
BARKER, CHARLES A., 1017 Cumberland Ave., Dayton. (Psychology).
BARR, DR. DANIEL R., Box 137, Grand Rapids, Ohio. (Physiology of Circulation. General Science as a matter of general interest).
BERGNER, SELMA RUTH, 220 Stanton Ave., Springfield. (Biology).
BITTER, MYLDRED L., 41 West College Ave., Springfield. (Biology; Zoology; Medical Sciences).
BOETTICHER, A. W., Ohio University, Athens. (Biology; Botany).
BOWE, LULU, 220 Stanton Ave., Springfield. (Zoology; Medical Sciences).
BROWER, A. B., 700 Fidelity Bldg., Dayton. (Medical Sciences).
CANOWITZ, AARON SIMPSON, 744 S. 18th St., Columbus. (Medical Sciences; Physiology; Pathology).
DE GANT, FRANK D., 3401 Wade Ave., Cleveland. (Entomology; Esp. External Anatomy).
DENNIS, (MRS.) MARSENA ANNE, 125 Euclid Ave., Marietta. (Botany; Zoology).
DORST, STANLEY E., Department of Medicine, Cincinnati. General Hospital, Cincinnati. (Medical Sciences).
ENGLISH, HORACE B., Antioch College, Yellow Springs. (Psychology).
EVERLY, RAY THOMAS, 1470 S. High St., Columbus. (Entomology; Botany).
FILINGER, GEORGE A., Ohio Agricultural Experiment Station, Wooster. (Entomology; Horticulture).
GAHM, O. E., 151 W. 11th Ave., Columbus. (Entomology; Plant Pathology).

* Reinstatement.

Gaskill, H. V., 1718 Bryden Road, Columbus. (Psychology).
Geist, Robert M., 811 Euclaire Ave., Columbus. (Entomology; Ornithology; Zoology).
Goldstein, Samuel, 414 S. Monroe Ave, Columbus. (Medical Sciences; Physiology; Pathology).
Hamlin, Howard Elroy, Hamilton Hall, O. S. U., Columbus. (Medical Sciences; Botany; Zoology).
Happer, Mary Louise, 1840 Crescent Drive, Springfield. (Medical Sciences; Bacteriology).
Horton, Clark W., Botany Department, O. S. U., Columbus. (Botany).
*Johnson, E. H., Kenyon College, Gambier. (Physical Sciences).
Johnston, Earl N., 18 Main St., Easthampton, Mass. (Zoology; Botany).
Koffel, Gerald Lowell, 1110 Sixth St., N. W., Canton. (Biology; Entomology).
Krueger, Lillian K., 548 Colburn St., Toledo. (Botany).
Leatherman, Gladys A., 227 W. Pleasant St., Springfield. (Zoology; Physiology).
McLaughlin, George D., University of Cincinnati, Cincinnati. (Bacteriology; Chemistry).
Miller, Ralph L., Department of Zoology, O. S. U., Columbus. (Entomology; Zoology; Botany).
Morgan, Richard, 1610 Hunter Ave., Columbus. (Geology).
Neiswander, Byron E., 1286 Primrose Place, Columbus. (Medical Sciences).
Newhall, A. G., Ohio Agricultrual Experiment Station, Wooster. (Botany; Plant Pathology; Plant Physiology).
Nice, Leonard Blaine, Hamilton Hall, O. S. U., Columbus. (Medical Sciences; Zoology; Botany).
Pew, David R., Miami University, Oxford. (Zoology; Anatomy).
Ridley, Lendell Charles, Wilberforce University, Xenia. (Psychology).
Savage, John R., Ohio Agricultural Experiment Station, Wooster. (Entomology; Zoology; Ecology).
Segelken, John G., 2321 W. McMicken Ave., Cincinnati. (Botany).
Semans, Frank M., 1690 Merrick Road, Columbus. (Zoology; Botany).
Simpson, Dr. Walter, Miami Valley Hospital, Dayton. (Medical Sciences; Pathology).
Sittler, Margaret, 115 E. Mulberry St., Lancaster. (Zoology).
Slagg, Rodney A., 433 E. Buchtel Ave., Akron. (Botany; Geology).
Sprague, Roderick, Department of Botany, Univeristy of Cincinnati, Cincinnati. (Botany; Plant Pathology).
Tashiro, Shiro, Medical College, University of Cincinnati, Cincinnati. (Medical Sciences; Chemistry).
Theis, Charles V., Department of Geology, University of Cincinnati, Cincinnati. (Geology).
Upham, J. H. J., 327 E. State St., Columbus. (Medical Sciences).
Von Schlichten, Otto C., University of Cincinnati, Cincinnati. (Geology).
Walker, Mary Elizabeth, 294 King Ave., Columbus. (Zoology; Entomology; Bacteriology).
Westenbarger, Mary Ellen, Magnolia, Ohio. (Zoology; Embryology).
Wherry, W. B., 759 Ridgeway Ave., Cincinnati. (Medical Sciences).
White, Monica, 100 Center St., Struthers, Ohio. (Zoology; Botany).
Wozencraft, Paul, U. S. Weather Bureau, Columbus. (Physical Sciences; Psychology).

## A Correction.

In some curious way the name of Mr. August E. Miller has never appeared in the list of members of the Academy. It should have appeared in the Proceedings of 1926, both in the list of new members and in the complete membership list as follows:

'26 Miller August E.; *Entomology*.....Urbana Ill.

* Reinstatement.

## The Scientific Sessions.

The following is a complete scientific program of the meeting:

### PUBLIC LECTURES BY INVITATION SPEAKERS.

The Relation of Physics to Biology.....Dr. William T. Bovie
The Use of the X-ray as a Means of Investigating the Structure of Protoplasm, Dr. Samuel J. M. Allen
Recent Researches in Audition.....J. B. Kelly

### PAPERS.

(Numbers in parenthesis after the title refer to abstracts).

1. Results from the Basic Research Laboratory of the University of Cincinnati.....President Herman Schneider
2. Some aspects of the problem of coagulation of the blood, Dr. Albert P. Mathews
3. Progress in practical meteorology (42).....W. C. Devereaux
4. The sessile flora and fauna of Norfolk Harbor in relation to the problems of fouling of ships' bottoms.....J. Paul Visscher
5. Notes on the millipede Cleidogona caesioannulatus Wood...S. R. Williams
6. Studies on the anatomy and histology of the alimentary canal of Euryurus erythropygus Brandt, a polydesmid millipede.....Hugh H. Miley
7. A study of the Ohio species of vespertilionidae.....James S. Hine
8. Fowler's Toad, Bufo fowleri, in Ohio.....Edward S. Thomas
9. Seven new mutants in Droophila funebris and their mode of inheritance, Warren P. Spencer
10. The development of the external sexual structures of Paraiulus venutus, Wood.....R. A. Hefner
11. The vegetation of Hungary and Roumania.....E. N. Transeau
12. Seasonal variations in the osmotic value of the leaf tissue fluids of the Pitch Pine.....B. S. Meyer
13. A new high record of the lifting of water in enclosed tubes by the energy of evaporation.....Hiram Thut
14. The genus Ascochyta of the sub-family Papilionideae of the Leguminosae, Roderick Sprague
15. The production of completely neutral or sterile tassels in Indian corn, J. H. Schaffner
16. Rare Teleutospores in rye rust.....O. L. Inman
17. The distribution of corn and some of its relatives in the light of recent archeological discoveries.....A. E. Waller
18. The behavior of corn under artificial light. (Introduced by A. E. Waller), Grace Collet
19. The Hazelwood Botanical Preserve.....John G. Segelken
20. Educating the public.....Katharine D. Sharp
21. The floristic regions of Ohio (1).....Robert B. Gordon
22. Plans for the spring field trip of the Section of Geology of the Ohio Academy of Science. (2).....A. C. Swinnerton
23. Quantitative vs. qualitative observations in Geology. (3)...Geo. D. Hubbard
24. The newer aspect of crystallography. (4).....O. C. Von Schlichten
25. The petrography of some slates. (5).....C. H. Behre, Jr.
26. Apparent orthogenesis in the genus spirifer. (6).....Carroll Lane Fenton
27. The affinities of the true stromatoporoids. (7).....George B. Twitchell
28. Nature and relationships of the genus aulopora. (8)..Mildred Adams Fenton
29. Recurrent faunas in the Cincinnatian (9a).....W. H. Shideler
30. A re-study of the Hamburg, Indiana, Section. (9).....W. H. Shideler
31. The occurrence of marine faunas during Richmond Times in more or less distinct provinces; the location and significance of these provinces, Aug. F. Foerste
32. The geology of Lucas County, Ohio. (10).....J. Ernest Carman

33. The Devonian Section on Pinal Creek, Arizona. (By title only.) (11), Clinton R. Stauffer
34. Pre-Pennsylvanian deformation in western Kentucky. (12)...W. R. Jillson
35. Some features of the Monongahela Series in eastern Ohio. (13)..Wilber Stout
36. Origin of the natural brines of eastern Ohio. (14).....Richard C. Lord
37. Features common to the Appalachian zinc deposits. (15)..Lawrence Freeman
38. Cyanite deposits of the southern Appalachians...William J. McCaughey
39. Some features of the lower Mississippian rocks of southern Indiana. (16), Paris B. Stockdale
40. The erosional history of the Blue Ridge (22a).....Frank J. Wright
41. Cenozoic history of the Montana Front Ranges. (17).....Arthur Bevan
42. A recently abandoned entrenched Meander. (18).....W. R. Jillson
43. The filled valleys of western Kentucky. (19).....Charles V. Theis
44. Observations on some Cincinnati landslides. (20).....J. K. Rogers
45. The depth of leaching of the early Wisconsin drift in Ohio. (21), G. W. Conrey and T. C. Green
46. Observations on dune structure. (22).....Walter H. Bucher
47. Cyclic variations in the basal metabolic rate of women. (23), Frances Wardwell and Fred A. Hitchcock
48. Basal metabolism and menstruation (46).....Chas. G. Rogers
49. Bile salts in blood.....S. Tashiro
50. The clinical importance of aberrant tissues. (24).....Kelly Hale
51. Multiple myeloma. A discussion of its histogenesis.....Karl D. Way
52. A statistical study of infectious diseases in Columbus for the past twenty-five years. (25).....Delbert A. Minder
53. Present trends in occupational diseases in Ohio. (26)..Byron E. Neiswander
54. Public health and medical work in the Consolidation Coal Company, (47) Daniel J. Kindel
55. The production and histologic changes in tartrate nephritis...Samuel Climo
56. Mitochondria of the kidney in acute experimental bichloride nephritis, (27).....Samuel Goldstein and Aaron S. Canowitz
57. Tumors of the kidney arising in some nerve cells (neuroblastoma). A discussion of their histogenesis.....Robert Snipes
58. Histogenesis of malignant mesenchymal tumors of the kidney, Bernard E. Ingmire
59. Health habits of university women students. A study based on findings at Ohio State University. (28).....Norma Selbert
60. The experimental production of carcinoma in mice and rabbits by the application of coal tar. A preliminary report. (29).....H. L. Reinhart
61. Studies on the effect of malignancy on the muscle physiology of the white rat.....Harwood A. Taylor and Kenneth E. Greenwalt
62. Disabilities of college students in certain "tool subjects" and their relation to college standing. (34).....H. J. Arnold
63. Some specifications for an elementary text in Psychology (35)..W. R. Wilson
64. Student self-ratings of quality of work. (36).....James P. Porter
65. The socialization of experience, a genetic experimental attack. (37), Martin L. Reymert
66. Psychological aspects of architecture, an experimental attack, Carl Schneider
67. Perceptions in the insane. (38).....H. G. Bishop
68. A preliminary report on an experimental investigation of Myer's Learning Curve Equation. (39).....Willard L. Valentine
69. Auditory discrimination in the white rat. (40).....Dorothy Disher
70. Counting the dust in the atmosphere.....W. C. Devereaux
71. The structure of space and matter. (45).....R. M. Manley
72. A striking method of demonstrating Lissajous' figures. (41). Ray L. Edwards
73. The glaze deposit at Cincinnati, Christmas Day, 1926.....W. C. Devereaux
74. The postulates and concepts of the quantum theory as applied to optical and X-ray spectra (43).....S. J. M. Allen
75. Dr. Hendrik Antoon Lorentz: A tribute. (44).....Maximilian Braam
76. Treatment of typhoid fever with detoxicated vaccine. (30).. W. B. Wherry
77. Tartrate nephritis. (31).....Ernest Scott and Samuel Climo

78. Multiple myeloma. (32),
KARL D. WAY, DR. F. M. STANTON AND DR. ERNEST SCOTT
79. The histogenesis of malignant mesenchymal tumors of the kidney. (33),
BERNARD E. INGMIRE

DEMONSTRATIONS AND EXHIBITS.

1. Core samples from salt dome cap rock.....WALTER H. BUCHER
2. Structural features of slates.....C. H. BEHRE, JR.
3. An exhibit of over 200 photographs (enlargements) by the Natural History Club, Ohio State University, Columbus, showing native Ohio mammals, reptiles, birds, nests and eggs, wild flowers, ferns, and fungi, in their natural surroundings, as well as several choice Ohio landscapes,
ROSCOE W. FRANKS, in charge
4. Drawings of Hawaiian dragonflies.....CLARENCE H. KENNEDY

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## ABSTRACTS
OF
## SCIENTIFIC PAPERS AND DISCUSSIONS AT THE CINCINNATI MEETING, APRIL 6 AND 7, 1928.

All members of the Academy taking part on the several programs of the 38th Annual Meeting at Cincinnati, either in the presentation of a paper or in the oral discussion that followed, were asked to prepare abstracts of their papers or remarks for publication in these Proceedings. This being in the nature of an innovation, the response has been quite gratifying and we are pleased to present the following outlines by the authors themselves. A few abstracts were received too late to be classified and were therefor put at the end of the list.

### A. THE SECTION OF ZOOLOGY.

ARTHUR W. LINDSEY, Denison University, *Vice-President*

### B. THE SECTION OF BOTANY.

HOMER C. SAMPSON, Ohio State University, *Vice-President*

#### *1. The Floristic Regions of Ohio.*

By ROBERT B. GORDON, Ohio State University, Columbus, Ohio.
(Author's Abstract).

Due to the influences of the last glaciation, and the subsequent migration of the deciduous forest into this state, over one hundred species of the northern flora are found as relicts in sphagnum bogs and in deep gorges throughout the State of Ohio, but are much more abundant

in the northeastern corner, where forests containing hemlock, white pine, and tamarack have in some cases developed and have persisted to the present time.

Forty-five species of plants, including *Andropogon furcatus* and *Silphium terebinthinaceum*, typical of the prairies, are found in Ohio, chiefly in regions where the forest is oak and oak-hickory. Over half of these species reach their eastern limit in Ohio. They are thought to have invaded the state during the xerothermic period which began well after the retreat of the glacier.

Some sixty species of plants, including *Castanea dentata* and *Magnolia acuminata*, are confined to the Allegheny Plateau in Eastern Ohio, extending northward to Lake Erie. It is in this region that mixed mesophytic forests occur.

Fifty species of plants, including one of the southern pines, *Pinus echinata*, are limited to the unglaciated portion of southern Ohio. Most of these are upland species which have apparently migrated northward along rock cliffs and high-level terraces of the old pre-glacial Teays River System from localities near its source in the northern Blue Ridge Mountains, where they were evidently distributed at the time of maximum glaciation.

The four regions thus outlined in Ohio may be called respectively, the Northern Floristic Region, the Prairie-Oak Floristic Region, the Allegheny Plateau Floristic Region, and the Southern Appalachian Floristic Region.

## C. SECTION OF GEOLOGY.

ALLYN C. SWINNERTON, Antioch College, *Vice-President.*

### *2. Plans for the Spring Field Trip of the Section of Geology, Ohio Academy of Science.*

By ALLYN C. SWINNERTON, Antioch College, Yellow Springs, Ohio.

(Author's Abstract).

It is planned to hold the 1928 spring field trip of Ohio geologists in the region of the Bellefontaine outlier (Devonian) and the Silurian and uppermost Ordovician near Springfield and Dayton. The time of the excursion is set for June 1st, 2nd, and 3rd.

The party will assemble at 10:00 A. M., June 1st, at the Ohio Caverns near West Liberty. After a trip through the cave the remainder of the day will be spent in a study of the Bellefontaine area under the direction of Professors J. Ernest Carman and C. F. Moses. On June 2nd the quarries in the vicinity of Springfield, Cedarville, and Osborn will be visited under the guidance of Dr. Aug. F. Foerste. The evening of June 2nd will be spent in Dayton where the group will be addressed by Arthur E. Morgan, president of the Dayton-Morgan Engineering Co., on the subject of the Miami Conservancy District. The following day will be spent in studying, under Dr. Foerste's direction, the Silurian of the Dayton region.

### *3. Quantitative vs. Qualitative Studies in Geology.*

By George D. Hubbard, Oberlin College, Oberlin, Ohio.

(Author's Abstract).

Geologists have ever studied and measured geologic processes and accomplishments, relatively, but it is time for us to do many phases of our work in a more quantitative way.

We can measure the rate of stream erosion by getting, for given time periods, the change in size and form of valleys. This should be done in many valleys. By careful measurements at the beginning and end of time periods we can get a rate of wave erosion and a rate of wave deposition. By measuring many waterfalls, each under different conditions, we can get a rate for fall recession. Rate of sedimentation can be gotten in lakes, in marshes, and possibly in shallower sea areas, and the rate of growth of deltas can be obtained by two accurate surveys separated by a considerable unit of time. Such measurements would not necessarily give us a key to geologic time but they would give us data concerning the actual present rate of geologic activities, and at the same time a better basis for estimating ancient rates of processes and of calculating geologic periods. The completed paper recognizes several pieces of quantitative measurement but the abstract could not note them.

### *4. The Newer Aspect of Crystallography.*

By Otto C. Von Schlichten, University of Cincinnati, Cincinnati, Ohio.

(Author's Abstract).

With but little modification Hauy's hypothesis, that crystals are built up of parallelopipeds, all of the same shape and dimensions for any given crystal, holds good at the present day. This hypothesis was formulated during the latter part of the eighteenth century. Later Bravais showed that only 14 different kinds of such parallelopipeds or space lattices could exist and these had the characteristics of crystal symmetry but were restricted to the symmetry of the holohedral classes of the seven crystal systems. Hessel, and later Gadolin, showed that 32 crystal classes could theoretically exist consistent with the law of rationality of parameters. In 1891 Schoenflies demonstrated that 230 kinds of point arrangements are possible and that these groups would fall within the 32 classes referred to. Whether these points were atoms, molecules or aggregates of molecules was not known with certainty but it was held by Groth that they were the atoms themselves.

In 1912 Dr. Laue, of Zurich, a former student of Groth, conceived the idea that the regularly arranged points of a crystal might be used as a three dimensional diffraction grating, as it was then believed that if X-rays represented a wave phenomenon the wavelengths must be of the order of the spacings of the atoms in solids. His conjecture was verified and thus a means was afforded to make precise measurements of the spacings between the atoms in crystals, to determine the shape and dimensions of the space lattice, and the number, position and kind of atoms within the lattice. Thus in this newer aspect of crystallography a powerful method was developed to greatly extend our knowledge of the ultimate constitution of solid matter.

### *5. The Petrography of Some Slates.*

By Charles H. Behre, Jr., University of Cincinnati, Cincinnati, Ohio.

(Author's Abstract).

Certain minerals growing during contact or dynamic metamorphism do not orient themselves with regard to maximum stress; these are "metacrysts." Examples are garnet, staurolite, chiastolite, and some chlorites. Secondary chlorite crystals in Ordovician slates of Pennsylvania, and chiastolite crystals induced by contact metamorphism in the English Skiddaw slates have this feature in common. Both show effects of subsequent deformation—the chiastolite by distorted form, the chlorite in alteration to tertiary muscovite. By analogy with the Skiddaw slates, therefore, the Pennsylvania slates have been twice deformed. This feature is cited as an illustration of the structural interpretation of metamorphic minerals.

Distinction is also made between "fracture cleavage" and "grain" in slate—terms generally regarded as roughly synonymous. "Grain" is probably present to varying extent in all mica slates, and is due to parallelism in the longer dimensions of mica flakes in the rock. "Fracture cleavage," however, is only anticipated in those slates which were folded after the development of secondary minerals. Slates, unlike shales, generally yield like brittle materials; they have their mica flakes at first bent, but soon broken, with very small-scale faulting, giving the "fracture cleavage" already recognized by several geologists.

### *6. Apparent Orthogenensis in the Genus Spirifer.*

By Carroll Lane Fenton, University of Cincinnati, Cincinnati, Ohio.

(Author's Abstract).

The group of late Devonian brachiopods characterized by the forms generally called *Spirifer orestes* H. & W. show numerous examples of apparently orthogenetic evolution. In each of the several lines or gentes composing the group, there is a marked progression from wide, thin shells with strong plications to narrow, gibbous ones in which the plications are weak. There also is a progression from shell ornament consisting of striæ, through nodose, broken striæ, to ornament of pustules which ultimately lose all trace of linear arrangement. To a considerable extent these sequences are correlated, and they may be traced in the ontogeny of gerontic specimens.

The fact that the changes appear at various times in various lines shows that they are not caused by progressive environmental change; and there is no evidence that the characters possess selective value. So far as can be determined, each evolutionary step is discrete, and possesses the character of a Morganian mutation.

To explain the regularity of the sequences, the hypothesis of advancing racial senescence is advanced. It is supported by the nature of the changes, which are distinctly degressive, and by the fact that ultimate stages in either sequence (of shape or ornament) are followed by extinction in several of the gentes.

### 7. *Affinities of the True Stromatoporoids.*

By George B. Twitchell, M. D., Cincinnati, Ohio.

(Author's Abstract).

M. Heinrich (Journ. Geol., Vol. 24) selected from the genera of the stromatoporoids a natural group consisting of *Clathrodictyon, Actinostroma, Stylodictyon, Parallelopora, Stromatopora* and *Stromatoporella. Hermatostroma* is doubtfully included.

These true stromatoporoids show one general plan of structure. They are made up of several layers or lamellæ. Each layer consists of several biological units arranged in one plane, and known as astrorhizal systems. An astrorhizal system communicates with the outer world by an opening at its centre, from which radiate branching canals, whose ultimate ramifications are in connection with those of adjoining units.

Systems in the several layers may be superimposed, communicating with one another by means of a central opening or astrorhizal cylinder. When they are not superimposed, connection between systems in different layers is effected by large arms of the astrorhizal system.

Laminæ are connected by pillars; the open spaces between these pillars are the ultimate ramifications of the astrorhizal tubes. The laminæ are pierced by small openings; each system is made up of a subdivided open space with one large central opening and many minute ones.

Each system therefore presents the plan of a simple rhagon sponge, with its osculum and numerous ostia. Their combination to form a stromatoporoid is identical with the union of many sponge units to form one of the Demospongiæ.

Many freshwater sponges present this arrangement in a very simple form, though marine ones generally lack definite layers. Such freshwater sponges as *Trochospongilla leidyi*, however, grows in the typical stromatoporoid manner; and the thesis here presented is that the stromatoporoids are related to the Demospongiæ, and particularly to the freshwater genus *Trochospongilla*.

### 8. *The Nature and Relationships of the Genus Aulopora.*

By Mildred Adams Fenton, University of Cincinnati, Cincinnati, Ohio

(Author's Abstract).

The name *Aulopora* has been applied to a group of supposed tabulate corals that are attached to foreign objects, and that reproduce by basal gemmation. The essential characters of the genus, however, are found also in *Stomatopora* and *Hederella*, two genera currently placed in the family *Diastoporidae*, of the cyclostomate bryozoans. There is some evidence, on the other hand, that the tubes of *Aulopora* were chitinous rather than calcareous; and it is significant that the bryozoan *Plumatella*, of the order *Phylactolæmata*, shows closely analogous structure. For the present, however, the hypothesis is advanced that *Aulopora* is a bryozoan belonging to the family *Diastoporidæ*, rather than a coral. Supposed large species of *Aulopora* actually show, in thin section, the characters of the coralline genus *Ceratopora*, and so do not affect this conclusion.

### *9. A Re-Study of the Hamburg, Indiana, Section.*

By W. H. Shideler, Miami University, Oxford, Ohio.

(Author's Abstract).

The Richmond section at Hamburg, Indiana, affords the only known instance of a connection between the Cincinnati embayment and that of the upper Mississippi Valley, thus affording a means of correlating the two series of deposits.

At the Ann Arbor meeting of the Paleontological Society, on the basis of this section the lower Elkhorn of the standard Cincinnati section was correlated with the Fernvale, and the upper Elkhorn with the Maquoketa.

A restudy of the Hamburg section, and of the Fernvale and Maquoketa, strengthens the correlation of the Elkhorn as a whole with the Brainard or upper division of the Maquoketa, as developed in Iowa, Wisconsin and Illinois. The lower divisions of the Maquoketa have no known equivalents in the Cincinnati section. The problem has been made difficult by the fact that the Brainard carries a recurrent Fernvale fauna. The exact position of the Fernvale was not determined, except that it rests upon the Arnheim in Tennessee, but according to Ulrich, near Nashville, it is overlapped by Waynesville.

### *9a. Recurrent Faunas in the Cincinnatian*

By W. H. Shideler, Miami University, Oxford, Ohio

(Author's Abstract)

From the Black River through the Richmond are many samples of recurrent faunas. Most of these are composed of small aggregates of species, and are not widely distributed, often being well developed only toward the outer end of a particular embayment, toward the place of origin.

In a broad sense, the Richmond as a whole is recurrent Black River-Trenton. Special faunules of the Richmond may be directly compared with special faunules in the Black River.

The Fairmount fauna of Kentucky and Tennessee carries a very large recurrent Cynthiana (Greendale)-Catheys fauna. The Fulton fauna is recurrent near the top of the Southgate, the Corryville fauna in the lower Arnheim, the Arnheim in the upper Waynesville (Blanchester), and the Fernvale in the Brainard.

### *10. Resumé of The Geology of Lucas County, Ohio.*

By J. Ernest Carman, Ohio State University, Columbus, Ohio.

(Author's Abstract).

Lucas County, located at the west end of Lake Erie, is entirely within the glacial lake plain and the surface is, in general, level. Features marking the shore lines of five of the glacial lake stages were recognized and their courses traced. These are in descending order, the Arkona, Warren, Wayne, Grassmere and Lundy. The Arkona and the Warren stages are marked by faint beach ridges; the Wayne, Grassmere and Lundy by sand hill belts, in part overlapping.

The geologic column of the county includes thirteen rock divisions ranging from the Niagara dolomite of Middle Silurian to the Ohio shale of upper Devonian and has a thickness of 700 to 800 feet.

Lucas County is on the west flank of the Cincinnati anticline and the rocks have in general a very gentle dip to the west. West of the center of the county there is a narrow north-south belt about one mile wide along which the westward dip is 6 to 8 degrees, a distinct monocline. Southward this monocline spreads out with a gentle dip but its exact course is continued southward by a fault with the upthrow on the east and with a displacement of 100 to 200 feet. This fault has been traced southward across Wood and Hancock counties.

### *11. The Devonian Section on Pinal Creek, Arizona.*

By CLINTON R. STAUFFER, University of Minnesota, Minneapolis, Minn.

(Author's Abstract).

Pinal Creek drains the area about Globe, Arizona. The Devonian section cut by it, at the limestone hill northwest of town, includes about one hundred feet of fossiliferous gray limestones and shales. These belong to the Martin limestone as described by F. L. Ransome. The section is unusually interesting in that it carries a rather large brachiopod fauna in addition to many of the corals so abundant in the same limestone at Bisbee. As has been pointed out by H. S. Williams and others, this is the same fauna as that occurring in the Lime Creek shales of Iowa. It is widely distributed over several of the extreme southwestern states where it represents a part of the Eurasian Devonian province. Although some of its species reached the eastern part of the North American continent by late Devonian time, it is to be remembered that the fauna as a whole did not get farther in that direction than Iowa and that some of its most characteristic species are wholly lacking in the New York upper Devonian. The probability is, therefore, that the migratory route to the East, for such species as reached northern Michigan and New York, was not by way of Iowa but by some more indirect or roundabout way such as the Mackenzie valley where these same southwestern species appear to be absent.

### *12. Pre-Pennsylvanian Deformation in Western Kentucky.*

By WILLARD ROUSE JILLSON, State Geologist of Kentucky, Frankfort, Ky.

(Author's Abstract).

The importance of giving consideration to the several major unconformities in the Paleozoic stratigraphical section when engaged in subsurface studies in Kentucky has long been recognized. Less attention than it deserves, however, has been paid by geologists to sub-surface unrevealed deformation, largely without doubt because it can usually only be indicated as a possibility even where the most painstaking efforts are expended in its investigation. That pre-Pottsville folding and faulting has occurred in Kentucky within the coal field area is now established by discoveries, the first of their kind in this state, made by the writer February 4, 1928.

In western Hart County, Kentucky, on the Nolin River within a mile of the Edmonson-Grayson County corner, there occurs at the mouth of Rock Creek near Sims Ford unmistakable pre-Pennsylvanian deformation.

On the northeast side of the panhandle of the meander of Nolin River at Sims Ford, in a low bluff Chester sandstones (Hardinsburg?) are set at angles ranging from 45 degrees to 60 degrees with strike south 10 degrees east. Within 8 or 10 feet horizontally bedded Chester limestones (Golconda) occur undisturbed. Superimposed is a strong and massive bed of the Pottsville conglomerate.

The discordant contact here of these three separated stratigraphic divisions of the Carboniferous rocks, if it be not due to a pre-Pottsville sink hole, adequate evidence for which is lacking, indicates the probability of the following sequence of geologic events: (1) Deposition of locally conformable Chester sediments; (2) Uplift, folding initialed from the south or southeast, rapid replacement of compression forces by tension, fracture and normal down-faulting on the south; (3) Subareal erosion with the development of pronounced local relief; (4) Depression and rapid deposition of the quartz sand gravels of the early Pottsville; (5) Subsequent uplift with the resultant erosion and exposure now in evidence.

### *13. Some Features of the Monongahela Series.*

By Wilber E. Stout, Ohio State University, Columbus, Ohio.

(Author's Abstract).

The Monongahela Series in eastern Ohio contains seven coal beds and five freshwater limestones, and extends from northern Jefferson to southern Gallia County, a distance of approximately 150 miles. Throughout the entire Ohio field both the coals and the limestones show remarkable continuity, seldom being absent and then only for short distances. The evidence thus indicates that the conditions favorable for depositories at these periods prevailed throughout the entire field, but were somewhat variable in intensity and duration, thus giving rise to differences in thickness, composition and structure of the members. Deposition during Monongahela time was regional and not local.

### *14. Origin of the Brines of Eastern Ohio.*

By Richard C. Lord, Kenyon College, Gambier, Ohio.

(Author's Abstract).

The rock salt beds extending from central New York to Eastern and South Central Ohio are found in the Salina formation of Silurian age. The Stassfurt deposits in Germany and the Kansas and Texas rock salt beds are found in the Permian period, decidedly more recent in geologic time.

In the sandstones and porous limestones above the Salina, in the basin west of the Appalachian mountains, are found brines, unique in the chemical composition, and in which the ratio of calcium, magnesium and bromin is an approximate constant. The content of calcium chlorid is somewhat more than twice the magnesium chlorid content. These

brines are probably the result of bittern, which did not crystallize when the salt beds of the Salina were formed in a closed basin, and which has become diluted to brines of varying strengths, by water which has infiltrated laterally in various formations, in a manner similar to water from artesian wells. Deductions as to the ratio of the various salts in oceanic water in Silurian time as contrasted with the present ocean water, may be drawn.

### *15. Features Common to the Appalachian Zinc Deposits.*

By Lawrence Freeman, University of Cincinnati, Cincinnati, Ohio.

(Author's Abstract).

Some characteristics brought out in state reports concerning the zinc deposits of Pennsylvania, Virginia, and Tennessee seem to be constant over the region at large. The zinc ores are practically limited to the dolomitic limestones of Cambro-Ordovician age, with dolomite as a gangue mineral. The sphalerite is concentrated in breccia zones in the dolomites and cherts where replacement of these by the zinc sulphide has been an important factor in ore deposition.

The commonness of light-colored sphalerite in this region is brought out. This variety, containing little iron, possibly represents secondary sphalerite. Iron going into solution with sphalerite in limestones does not travel far but is almost immediately precipitated as limonite due to the neutralizing environment. The iron oxide found lining individual cells in the oxidized zone may in part represent iron present in the original sphalerite. The zinc sulphide in solution would be carried to greater depths before being precipitated as sphalerite. If light-colored sphalerite results from secondary concentration, then the commonness of this variety of sphalerite within the region described might be helpful in establishing the secondary origin of much of the ore.

### *16. Some Features of the Borden (Knobstone) Rocks of Southern Indiana.*

By Paris B. Stockdale, Ohio State University, Columbus, Ohio.

(Author's Abstract).

The stratigraphy of the Borden (Knobstone) division of Mississippian strata in southern Indiana has been studied by the writer during the past two field seasons. Previous works on these rocks have been incomplete and disconnected. Because of the undesirability of a descriptive word, the term "Knobstone" was abandoned, and "Borden," from the village of Borden, was introduced by E. R. Cumings in 1922.

The Borden rocks, often correlated with the Waverly of Ohio, lie upon the Rockford (Kinderhook) limestone. They are overlain by the Harrodsburg (Warsaw) limestone. Thus, they represent a distinct stratigraphic unit of predominantly clastic material, sharply delimited. South of the glacial boundary, the rock group thins from north to south, and east to west, maximum thickness being nearly 800 feet. The Borden displays marked variability both vertically and laterally, and lacks, with one exception, well-defined, persistent horizons to designate formation subdivisions.

In the vicinity of Borden, the basal 150 feet is a pure shale. Upwards, this grades into sandy shale, the transition being very gradual. Finally, it passes into a massive sandstone (400 feet above the base), which has a thickness of 100 feet, and is characterized by large brachiopods, especially *Syringothyris textus* and *Orthotetes keokuk*, and abundant bryozoa. Above the sandstone is a lenticular limestone, up to five feet thick, named the Steven's Creek limestone by C. A. Malott. Overlying this are 40 feet of alternating sandstone and sandy shale layers, non-fossiliferous. Variations from the type section, and many special features furnish interesting complexities.

### *17. Cenozoic History of the Montana Front Ranges.*

By Arthur Bevan, University of Illinois, Urbana, Illinois.

(Author's Abstract).

The Rocky Mountains do not have a single front range in Montana, but the frontal zone consists mainly of five distinct ranges which are aligned in an almost unbroken northwesterly belt. Two or three ranges not directly aligned with the others are closely related to them. Each range appears to be a separate structural unit, whose Cenozoic history has differed sufficiently to impress individual characteristics on it. Each member of the front range group, however, was probably affected considerably by certain major cycles of events.

Until the history of each range has been deciphered in some detail, it is hazardous to interpret one range in terms of another or to generalize for the entire region. The known data permit, however, this provisional outline of the major Cenozoic events as a basis for future studies:

1. Late Cretaceous and early Tertiary orogeny developed overturned folds and overthrusts which form the main structural lineaments.
2. Early (?) Tertiary vulcanism, both intrusive and extrusive, added smaller ranges to the main group and partially altered some of the folded and faulted ranges.
3. Pre-Middle Miocene erosion reduced at least a few ranges to surfaces of low relief, and, perhaps, to an extensive peneplain.
4. Local vulcanism occurred during the Miocene.
5. Middle (?) Miocene vertical uplift with some warping; folding and faulting relatively unimportant.
6. Pre-Quaternary erosion to mature or old-age surfaces.
7. Early Pleistocene vertical uplift with gentle warping.
8. Pleistocene glaciation in at least three stages, with some intervening, and perhaps post-glacial, vertical uplift.

### *18. A Recently Abandoned Entrenched Meander.*

By Willard Rouse Jillson, State Geologist of Kentucky, Frankfort, Ky.

(Author's Abstract).

Abandoned stream meanders in old low lands are commonplace, abandoned entrenched meanders evidently of Pleistocene or greater age are not uncommon in certain limestone districts such as the Bluegrass of central northern Kentucky, but recently abandoned entrenched meanders are sufficiently unusual to hold the layman's attention and

give the geologist pause. In a remote part of Western Kentucky about twelve miles northeast of the Mammoth Cave, on the lower waters of Dog Creek, a northwest flowing tributary of the Nolin River, such a unique physiographic feature is well developed and has not previously been described. This meander was observed and photographed by the writer February 5th, 1928.

As is the case in many abandoned meanders, this feature was produced by lateral cutting on the outside of two closely adjacent "moccasin" bends in the course of Dog Creek. Field evidence indicates that cutting in the toe of each of these abutting but distinct meanders advanced until not more than 15 or 20 feet of the dividing ridge of thin bedded Glen Dean limestone remained. About this time solution along bedding and joint planes must have been greatly aided by fine abrasive materials in the form of sharp silica sand with which this stream is abundantly supplied. Perhaps a natural limestone bridge existed for a short time.

Collapse of this rock span followed by a rather rapid removal of the fallen calcareous blocks came in sequence, but this stage has been so recently completed that a uniform gradient has not yet been established across the breach which itself is hardly fifty feet across. In effecting the "cut off" Dog Creek shortened its course upwards of one and one-half miles, superinduced rapid downward cutting of several feet in its limestone bed just above the "breach" with the resulting development of about 400 feet of low cascades or rapids. These were utilized by early residents for water power purposes.

The opening of the "breach" is still actively in progress but has not progressed far enough yet to allow even a foot path through it at water level. From whatever angle it may be viewed this cut-off is recent, very recent.

While one is impressed with this fact, natives indicate that no change has occurred here since the period of settlement, upwards of 100 years or more ago. Stream erosion is admittedly slow, rock falls under such conditions as here depicted could not be other than so gradual as to fail to startle the untrained native observer. Measured, however, beside personally observed Greek, Roman, and early British limestone walls, all now in various stages of disintegration, this "breach," subjected to the occasional though certain torrential flood waters of Dog Creek, may reasonably be assured to have occurred originally between 500 and 1000 years ago.

### *19. The Filled Valleys of Western Kentucky.*

By Charles V. Theis, University of Cincinnati, Cincinnati, Ohio.

(Author's Abstract).

This paper aims to trace the development of the broad filled valleys of the western Kentucky coal field.

It is shown that the rock bed of the Ohio and tributary streams in this section probably represents two stages of cutting; a first, in which a broad platform was developed at an elevation of about 300 feet in this section, and a second, in which a trench was sunk about 100 feet deeper. The date of this cutting was probably early Pleistocene.

The main filling of these valleys, as now preserved, was performed in Wisconsin time, as proven by tracing the terrace level up stream.

The assumption frequently made that these broad filled valleys indicate differential depression of this region is shown to be erroneous because the river is now cutting at the elevation at which it cut when the broad valleys were excavated. On the other hand it is shown that there has probably been depression since the time of cutting of the trench. This depression, however, is probably not limited to this region.

### *20. Observations on Some Cincinnati Landslides.*

By J. K. Rogers, University of Cincinnati, Cincinnati, Ohio.

(Author's Abstract).

The object of the paper is to call attention to features observed in connection with several landslides, not to present generalized conclusions.

A slide occurred on the slope below Bethesda Hospital in thick glacial till and terrace material; probably the movement here did not extend down to the bedrock surface.

At Sedansville the sliding has been more extensive and much more destructive, affecting seriously the switching facilities of the Big Four Railroad over a length of an eighth of a mile, and destroying a number of residences. The original angle of slope was probably twelve degrees. The pattern of cracks developed, as shown on a sketch map of the area, is characteristic of the slides so far observed.

Four or five smaller slides are described, notably one below McMicken Avenue; these are of the same general type, but differ in some important respects.

Several generalizations seem justified from the cases considered: The sliding here has been confined to unconsolidated material, chiefly glacial till and terrace deposits. These materials are plastic and flow readily when wet. The more extensive of the slides here considered have taken place on slopes of about twelve degrees. In each case, cracking has been prominent, concentric cracks appearing at the upper limit of the slide, enechelon cracks at the lateral margins. Undercutting at the base of the slope and saturation below the surface of the clay or till are important as contributing factors.

### *21. The Depth of Leaching of the Early Wisconsin Drift in Ohio.*

By G. W. Conrey and T. C. Green, Ohio Agricultural Experiment Station, Wooster, Ohio.

(Authors' Abstract).

From the standpoint of age the Early Wisconsin drift is intermediate between the Late Wisconsin and Illinoian drift. The Illinoian drift in southwestern Ohio has been leached of carbonates to a depth of 8 to 10 feet, the Late Wisconsin to 2 or 3 feet. Over much of Butler County the depth of leaching of the Early Wisconsin drift is little, if any greater than the Late Wisconsin. However, in favorable sites, such as broad undulating to gently rolling areas the depth to lime may be as much as 48 to 56 inches. Apparently the rolling surface of much of Butler County, with sheet wash on some relatively smooth areas has been a factor in producing a shallower leached zone over much of the county.

In the Early Wisconsin drift there is a well defined transition zone, free from carbonates, between the heavy upper subsoil, and the calcareous unleached till, which is either very thin or entirely lacking in the Late Wisconsin drift.

It is very evident that care must be used in selecting sites for studying the depth of leaching or very erroneous conclusions may be drawn.

### *22. Eolian Versus Subaqueous Cross-Bedding.*

By Walter H. Bucher, University of Cincinnati, Cincinnati, Ohio.

(Author's Abstract).

The lines that constitute the pattern of "cross-bedding" are the outcrops of surfaces of two kinds that represent opposite processes. The laminæ of ordinary cross-bedding represent surfaces of *deposition*, while the surface that normally teminates them above, represents a surface of *removal*. Attempts to distinguish between subaqueous and eolian cross-bedding (by Grabau and others) have been directed toward the details of the contact of laminæ of deposition with adjoining surfaces of removal. Twice the writer has made careful observations on the character of cross-bedding in the Indiana dunes at the south end of Lake Michigan, with the following result. In these dunes laminæ of deposit with adjacent surfaces of removal form layers up to a foot or two in thickness quite comparable to fluviatile cross-bedding. For tens of feet the surfaces of removal form a series of roughly parallel lines in the outcrop simulating the subparallel bedding of fluviatile sediments. In the Indiana dunes there exist, however, surfaces of a higher order, cutting obliquely across the cross-bedded layers below them and having above them another thickness of cross-bedded sands roughly parallel to the new inclined base. To the writer it seems that the presence of these surfaces of removal of a second or higher order is the only true criterion of eolian cross-bedding.

This point is illustrated by pictures taken by the author and by other observers.

### *22a. The Erosional History of the Blue Ridge.*

By Frank J. Wright, Denison University, Granville, Ohio.

(Author's Abstract).

Keith in his study of the Blue Ridge of the south, described two peneplanes in addition to the magnificent erosion surface of the Piedmont to the southeast. These have been recognized by the present writer. Keith interpreted them as representing the work of three cycles of erosion. The highest erosion level, developed over broad areas, now stands at elevations varying from 3,000 to nearly 4,000 feet, and probably corresponds to the Upland or Cretaceous (?) peneplane of the Newer Appalachians. The second level, represented by the Asheville surface, is preserved in a number of valleys from 2,200 feet, around Asheville, to over 3,000 feet in the higher basins. It is suggested by the writer that this series of local high-lying peneplanes in the older Appalachians was developed contemporaneously with the Piedmont peneplane on the southeast and the Appalachian Valley (Tertiary ?) peneplane on the northwest.

## D. SECTION OF MEDICAL SCIENCE.

EMERY R. HAYHURST, Ohio State University, *Vice-President.*

### *23. Cyclic Variations in the Basal Metabolic Rates of Normal Women.*

By FRANCES R. WARDWELL and FRED A. HITCHCOCK, Ohio State University, Columbus, Ohio.

(Authors' Abstract).

The work reported in this paper includes 475 Basal Metabolic Rate determinations made with the Benedict-Roth Graphic type of apparatus. Of these 125 were run during the menstrual flow and 350 during the intermenstrual periods. They were run consecutively on 21 different women, students at Ohio State University during different periods of the year.

It was concluded that information secured gave added data to support the view that:

1. The metabolic rates of normal women are subject to a cyclic variation;
2. That the lowest point in this cycle occurred during the normal menstrual flow;
3. That the amount of variation in each test reported, is greater than twice the statistical probable error.

### *24. The Clinical Importance of Aberrant Tissues.*

By KELLEY HALE, M. D., Wilmington, Ohio.

(Author's Abstract).

Aberrant tissues are not to be confused with doubling or duplication of organs and are defined as a piece of an organ which has strayed away from and having no connection with the parent organ but possessing histologically all or nearly all of the normal elements. Serious and sometimes fatal issues result from aberrant or accessory tissues and they give trouble not only as a mechanical agent but possess malignant potentialities. Notation with references are made to the numerous situations of aberrant tissues.

The author presents the following cases of his own:

Case 1. Patient having a small movable tumor in the posterior triangle of the left side of her neck which proved on microscopic examination to be a colloid goiter developing from an accessory thyroid. Roentgenogram of this patient's chest revealed a large smooth mediastinal tumor which has proved to be an accessory mediastinal thyroid; malignancy having been ruled out by treatment and time.

Case 2. Accessory pancreas causing congenital pyloric stenosis in a six weeks' old infant. Death followed Rammstedt's operation. It is thought that the activity of the cells of the aberrant pancreas irritated the musculature of the pylorus to such an extent as to cause pathologic changes. Thereby another solution is added to the etiology of this disease. This case was fully reported in Annals of Surgery, June, 1926.

Case 3. A patient manifesting symptoms of acute appendicitis at laparotomy was found to have a kidney-colored, encapsulated tumor

which on section revealed typical and distorted tubules with an occasional renal cell. No glomeruli were present. This tumor was classified as either aberrant renal or Wolffian body tissue.

Only a thorough study of embryology will reveal the mystery of how aberrant tissues come to be. Being interested in the yet undiscovered controlling mechanism of ontogeny, the author has found in the eggs of the physa and other fresh water gasteropods, fine equatorial lines located in the inner cell membrane resembling phonographic lines. Research from year to year has led to the discovery of a very complex set of meridinal lines that radiated from a very definite point located not far from the lesser end of the egg within the inner cell membrane and extending a variable distance beyond the equator. At first they are refractile lines, later breaking up into strands of beads and have a bilateral arrangement. Theoretically these lines can be fitted into the role of that undiscovered controlling mechanism of ontogeny.

Aberrant nodules, duplication of organs and the multitude of anomalies, atavism, evolution and mutations will not be understood until this control is discovered.

### *25. A Statistical Study of the Infectious Diseases in the City of Columbus, Ohio, for the Past Twenty-five Years.*

By DELBERT A. MINDER, Columbus, Ohio.

(Author's Abstract).

Using as an index Typhoid Fever, Measles, Whooping Cough, Diphtheria, Influenza, Lethargic Encephalitis, Meningitis, Scarlet Fever, Broncho and Lobar Pneumonia, a preliminary survey regarding the mortality, the relative increase or decrease of all the acute infectious diseases was made.

The data used was secured from the vital statistics of the City Board of Health at Columbus, Ohio. The yearly increase in population was obtained from the United States Bureau of Census. Charts were made showing the actual mortality rate per 100,000 population for every month during the years of 1907 to 1925 inclusive. Likewise a similar chart showing the general mortality for all the acute infectious diseases was made and analyzed.

Considering those diseases which were used as an index, an analysis of the charts used showed: First: Typhoid Fever, Diphtheria, Scarlet Fever, Measles, Meningitis, are rapidly declining as a cause of death. This decline in death from the acute infectious diseases is an important factor in prolonging life. Second: Those diseases which seem to affect the respiratory system are on the increase. These are essentially Influenza, Broncho and Lobar Pneumonia. Third: That the first death from Lethargic Encephalitis was not reported until 1920 and that this disease is on the increase.

The chart showing the general mortality revealed that: First: Excluding a few flare-ups which have been considered to be epidemics, it can be said that death from the acute infectious diseases is on the decline. Second: This decline is neither marked nor rapid, but on the contrary is quite gradual. Third: Since the actual mortality is an index

to the frequency of occurrence of these diseases the statement can be safely made that they are occurring almost as often as they used to occur. Fourth: This chart coroborates the previous statement that the chief contributors to the number of deaths are from those diseases which affect the respiratory tract. Fifth: Most of our epidemics have and still are occurring during the winter months. Sixth: The majority of deaths happen in the first one-third of the year. The least number of deaths occur in the summer time.

### *26. Review of Occupational Disease Report.*

By Byron E. Neiswander, M. D., Chief, Division of Industrial Hygiene, Columbus, Ohio.

(Author's Abstract).

The Division of Industrial Hygiene has recently completed a statistical study of the occupational diseases reported to the State Department of Health in the last two and one-half years ending December 31, 1927.

During that time a total of 2,930 cases were reported by the physicians of the state, of which 2,738 were included in the list compensated by the Industrial Commission similar to accidents and 192 were occupational diseases not compensable. The above figures show that the great majority of diseases reported are those which are classed as compensable though comparison with the figures for the previous five years (1921–1925), show that non-compensable case reports are increasing very rapidly. The yearly average increase of compensable diseases is 71% and of non-compensable 997%.

Evidently the systems of spread of information promoted by the State Department of Health and the Department of Industrial Relations are bringing results. Some interesting points shown are:

1. No cases of anthrax, glanders, phosphorus, or wood alcohol, all in the compensable list, have been reported in the last two and one-half years.
2. Lead poisoning, which is compensable, is a most important source of occupational diseases—450 cases.
3. Dermatoses make up the great majority of those cases which are compensable—2,210 cases, of which 608 occurred in the rubber industry.
4. Oils and cutting compounds used with metal products are excellent media for the spread of infections of the skin—395 cases.
5. Three groups show a decline in the number of cases reported, namely, lead poisoning in automobile manufacturing, benzol poisoning, and dermatoses in rubber plants.
6. The Division of Industrial Hygiene will publish its full findings in the near future.

### *27. Mitochondria of the Kidney in Acute Experimental Bichloride Nephritis.*

By Samuel Goldstein and Aaron S. Canowitz, Columbus, Ohio.

(Authors' Abstract).

An attempt has been made to determine the variations that mitochondria undergo in bichloride nephritis and to correlate these findings

with the degree of functional impairment of the cells involved. The mitochondria were best studied with the anilin fuchsin-methyl green stain (Cowdry's modification), but iron hematoxylin and Janus green B were also used. White rats were used and blood urea determinations were made on all animals just prior to death. After carefully eliminating all normal variations the following conclusions were reached: The mitochondria of the proximal convoluted tubule, being predominately rod like, underwent a gradual transformation into the granular form and, in more advanced stages of the disease, the granules enlarged and coalesced into droplets and larger masses with lipoidal staining qualities. These changes occur before the disease is evident by ordinary staining, these variations constituting, therefore, anatomic changes indicating pathologic processes which would ordinarily be overlooked. In view of the fact that a high degree of urea retention is present with only very slight mitochondrial alterations, we are led to assume that secretion is not dependent upon mitochondria nor are mitochondria altered very greatly by inhibition of secretion.

### *28. Health Habits of University Women Students.*

By Norma Selbert, R. N., B. S., M. A., College of Medicine, Ohio State University, Columbus, Ohio.

(Author's Abstract).

The object of this paper: to present problems connected with the health habits of women who were students in the Ohio State University during 1927–1928. The study included inquiry using a questionnaire, personal conferences, and visits to students' homes.

The questions are based on "Rules of the Health Game," advocated by The American Child Health Association and the Bureau of Education in the U. S. Dept. of the Interior; the "Health Chores" advocated by the National Tuberculosis Association; and also the principles adopted by the Joint Committee of the National Education Association and the American Medical Association. "The 'Health Behavior Scales'" recently published by Dr. Thomas D. Wood and Dr. Marion Lerrigo include standards which these questions suggest. These are answers to questions asked while making study:

| | *Affirmative* | *Negative* |
|---|---|---|
| 1. Do you take a bath more than once a week? | 280 | 4 |
| 2. Do you brush your teeth thoroughly at least once a day? | 281 | 3 did not reply |
| 3. Do you sleep 8 hours out of every 24? | 75 | 209 |
| 4. Do you sleep with one or more windows open? | 280 | 4 |
| 5. Do you drink a pint of milk each day? | 20 | 264 |
| 6. Do you drink tea oftener than once a day? | 10 | 274 |
| 7. Do you drink coffee oftener than once a day? | 194 | 90 |
| 8. Do you eat fruit or vegetable each meal? | 80 | 204 |
| 9. Do you drink at least four glasses of water each day? | 75 | 209 |
| 10. Do you play out of doors a part of every day? | 90 | 194 |
| 11. Do you have a bowel movement every morning? | 124 | 160 |
| 12. Do you work four or more hours each day, except Sundays? | 284 | |

The daily living of the student may be regarded as an index to what he applies or that which he or she has learned in hygiene. Answers to questionnaires, such as this, usually indicate whether or not parents and teachers have been successful in training young people to habits which they should have formed before they reached college.

Health is largely personal responsibility, but the teaching of hygiene will never be more than superficially effective until teachers are concerned with conditions under which students must sleep and eat and work. It is not enough to tell a student that he must sleep in a well ventilated room. He should know why it is essential to have fresh air at all times and how he can provide healthful ventilation for himself. He should be taught how to analyze, and how to transform his environment so as to promote health.

Many who are teaching hygiene lack the medical background necessary for teaching. Many who are teaching lack what is necessary to teach hygiene effectively, even though they possess sound training in medical sciences. Knowledge of certain subject matter is not sufficient for successful teaching. The technique of superior teaching includes much which is not taught in medical schools. "The chief criticism of hygiene, as taught by the usual instructor, is that it is academic." Most teachers tend to develop the subject far beyond its usefulness, and they are frequently formalists. Instruction in hygiene should be practical and should be connected with conditions under which the student must live. The aim should be to develop an individual who can live at his best wherever he may find himself.

### *29. Experimental Tar Cancer.*

By Harry L. Reinhart and Robert L. Solt, Department of Pathology, Ohio State University, Columbus, Ohio.

(Authors' Abstract).

A review of the history of Experimental Tar Cancer reveals that it was the logical result of observations on the occurrence of industrial tar cancer. The experimental production of Tar Cancer was delayed for many years as a result of three factors, which are now well known, viz., (1) variations in coal tar, (2) variations in susceptibility of laboratory animals, and (3) the length of time that the irritant must be applied before the malignancy develops. With the increasing production of experimental tar cancer in many laboratories, all of these factors have been more or less modified. However, their fundamental importance is still manifest, and of these factors, the length of time necessary for a carcinogenic tar to produce a definite malignancy in a susceptible animal, is the most important, and adds weight to the theory of chronic irritation.

In our own experiments, using samples of tar from various sections of the country, obtained through the courtesy of the Department of Mining Engineering of the Ohio State University, we have produced tar cancer in white mice and rabbits. These experiments are of a preliminary nature, and have been conducted that we might observe the development of tar cancer, determine which of our samples of tar are potentially carcinogenic, and improve our technique for a continuation of the work.

### *30. Treatment of Typhoid Fever with Detoxicated Vaccine.*

By W. B. Wherry, Cincinnati General Hospital, Cincinnati, Ohio.

(Author's Abstract).

The vaccine is prepared by treating the antigen with formaldehyde, the method used by Ramon of the Pasteur Institute of Paris in the production of anatoxins—detoxicated toxins which retain their antigenic properties. This method does not completely detoxicate the typhoid bacillus but experience has shown that about 100,000,000 (0.1cc) treated bacilli may be injected subcutaneously into a typhoid patient, daily, without any harm. Such injections are followed by a local area of congestion which subsides in 24 to 36 hours.

The results obtained in treating 28 cases of typhoid diagnosed bacteriologically early in the course of the disease as compared with 68 controls will appear shortly in the Journal of Infectious Diseases. The findings are briefly: (1) the temperature tends to fall to normal after the seventh or eighth daily dose and proceeds to normal by an irregular lysis, the course of the disease being greatly shortened when early treatment is given; (2) there appears to be a marked reduction in the mortality and the number of complications; (3) cases given early treatment have a rapid convalescence; (4) even late toxic cases seem to be benefited by the treatment.

(Physicians desiring to use the vaccine will communicate directly with Dr. John E. Monger, State Department of Health, Columbus, Ohio, or with Dr. W. B. Wherry, Cincinnati General Hospital.)

### *31. Tartrate Nephritis.*

By Ernest Scott and Samuel Climo, Department of Pathology, Ohio State University, Columbus, Ohio.

(Authors' Abstract).

A survey of the literature covering experimental tartrate nephritis was rendered. Apparently no work has been done up to the present time, in which the albino rat has been employed as the experimental animal and consequently it seems of some value that the effects of tartrate upon the rat kidney be determined and compared with the nephritis occurring in other types of laboratory animals following the administration of tartrates.

### *32. Multiple Myeloma.*

By Karl D. Way, Dr. F. M. Stanton, and Dr. Ernest Scott, Department of Pathology, Ohio State University, Columbus, Ohio.

(Authors' Abstract).

The literature contains the report of 169 cases of well authenticated cases of multiple myeloma, the diagnosis of such cases being based upon a histological examination. The peculiarities of this type of tumor consist in the fact that they originate in the bone marrow and may involve many of the bones of the body simultaneously. The tumor cell is a derivative of bone marrow cell, in some instances arising definitely

from the granular series, in other cases apparently from the lymphoid tissues. The usual microscopic appearance is that of a rather large plasma cell. To the number found in literature, the Laboratory of Pathology, the Ohio State University, is adding three (3) additional cases.

### *33. The Histogenesis of Malignant Mesenchymal Tumors of the Kidney.*

By Bernard E. Ingmire, Department of Pathology, Ohio State University, Columbus, Ohio.

(Author's Abstract).

A group of tumors of the kidney have been observed in which there are a number of cell types: mesenchyme, adenomatous acini, glomeruli, cartilage, bone, smooth muscle, fat, connective tissue. These tumors have been called by a variety of names: adenomyosarcoma, embryoma, embryonal adenosarcoma, embryonic sarcoma, mesothelioma, embryonal adenocarcinoma, myxosarcoma, Wilm's tumor, teratoma, and sarcoma. After a review of the literature, a study of seven specimens in the Museum of Pathology, at The Ohio State University, and a careful survey of the embryology of the kidney, it is our opinion that these tumors are all derived from one source—the mesenchyme of the nephrogenic ridge and that the variation which is observed is the result of individual variation from case to case, and also in a great many cases from a failure to examine a sufficiently large amount of tissue of any one tumor.

(Note.—Abstracts 46 and 47 also belong to this Section.)

## E. SECTION OF PSYCHOLOGY.

A. Sophie Rogers, Ohio State University, *Vice-President.*

### *34. Disabilities in College Students in Certain "Tool Subjects" and the Relation of Such Disabilities to College Standing.*

By Henry J. Arnold, Wittenberg College, Springfield, Ohio.

(Author's Abstract).

That deficiencies in background preparation constitute a serious handicap to a student's academic success in college, has become almost axiomatic with college administrators and instructors. However, in general, efforts to determine the specific nature and extent of such deficiencies as the student may have when he enters college, have been almost negligible.

Recent studies carried on by the Department of Educational Psychology of Ohio State University have revealed striking deficiencies in the so-called "tool subjects" of students entering the university, and point out the extent to which such disabilities may be corrected by the student himself provided the remedial work is carefully planned and

executed. It is shown that college standing of students can be materially raised by adequate methods of rehabilitation.

In an attempt to secure further evidence bearing on this problem, a group of diagnostic tests in the various "tool subjects" was given to several classes of under-classmen (mostly Freshmen) at a certain Ohio College. In this report, the results of two of the tests, Arithmetic (Monroe's Diagnostic) and Algebra, (Hotz' Scales) are given as being typical of the findings for the entire series.

In the Arithmetic, 24% scored below the eighth grade norm in all the 21 tests, while 41% average below the same level in four tests in division. Zero scores average over twice as common in division as in multiplication. More than 50% of the zero scores were made in fractions. 31% failed at least one test in fractions and three made zero on four out of five of the fraction tests. Eight students out of the 83 scored zero on four or more tests. It is shown that such deficiency in Arithmetic constitutes a noticeable handicap in Chemistry which requires proficiency in rather complicated Arithmetical processes. Another group of 40 students (Freshmen) showed a gain of 41% improvement on the Monroe Diagnostic Tests in Arithmetic following a six-weeks period of remedial instruction involving the specific deficiencies as determined by the original test. These 40 students had received "below passing" scores in the first trial.

The deficiencies in elementary Algebra, as revealed by an analysis of the errors, were equally striking. The percents of the fifty-three students who scored below the standard norms for first year high school pupils in each of the scales are as follows: Addition and subtraction, 75%; multiplication and division, 76%; equation and formula, 56%; problems, 56%; graphs, 58%, or an average for all tests of 64%. The greatest deficiency was found in ability to handle operations with fractions, the difficulty centering around inverting of the divisor, least common denominator and factoring preparatory to cancellation. Some of the other difficulties which lowered total scores were: removing parenthesis, forming a simple equation, transposition, removing radicals and simplification. The errors were all of such a nature that, with proper remedial practice, the student could soon remove the deficiency. The close relation between elementary algebra and physics, and the significance of algebra in trigonometry and other branches of college mathematics, emphasizes the necessity of assisting the student to master the fundamental operations in the elementary course.

It is maintained that colleges should assume the responsibility of aiding students who have deficiencies in tool subjects by (1) determining, by means of diagnostic tests and other diagnostic methods, the specific nature and extent of such deficiencies, and (2) by providing carefully developed methods for remedial instruction. It is claimed that such procedure will, if properly carried out, do remarkable things in the way of rehabilitating many college students whose progress through college might otherwise be greatly impeded. It is also suggested that a college "educational diagnostician" could do much to prevent failures and raise the general level of college work.

*35. Some Specifications for an Elementary Text in Psychology.*

By William R. Wilson, Ohio State University, Columbus, Ohio.

(Author's Abstract).

It is desirable that teachers of elementary psychology work out definitely their educational aims. Elementary text books in psychology should be evaluated using these aims as criteria. Commonly the aim of the teacher of psychology is to give information, which in practice means bringing about the formation of precarious verbal habits. Probably the most important justification for elementary psychology is not its value as information but the training value that it may be made to possess. It cannot be safely assumed that information and training go hand in hand. With training in scientific method in the field of psychology taken as a criterion certain specifications for a utopian text are laid down. This model text will not be "eclectic" but will present a highly consistent system throughout. It will make no effort to please all readers by being all things to all men. If it errs by being dogmatic this is a venal sin to be preferred to the muddled eclecticism of the conventional text. The writer will avoid dogmatis, however, by realizing that the "scientific fact" is a fiction and by pointing out clearly the part that system making plays in psychology. The general problems of the science will be rather fully presented. This will require considerable space, but that will be a gain as it will necessitate the elimination of a vast amount of traditional material included in most texts for no valid educational reason. The conventional handling of the nervous system will be considered in detail as an example of this useless verbiage. Finally, the text will be representative of the state of psychology in the year in which it is written.

*36. Student Self-Rating in Quality of Work.*

By James P. Porter, Ohio University, Athens, Ohio.

(Author's Abstract).

How accurate an estimate can the student make of his grade some ten days before the close of the semester? Such an estimate may be of value in itself. It may also be an indicator of a tendency toward over- or -under-estimation or of accurate judgment in other respects.

This study yet in its preliminary stages was undertaken to learn if possible what are the influences on estimated grades of the kind and number of tests or examinations, the kind of instruction used—whether merely lectures or both lecture and laboratory—and the personality of the instructor.

An able young woman practiced in teaching and the giving of objective tests was furnished with a graphic rating scale with carefully written instructions and phrases beneath the line to be checked as follows: "Excellent," "Above Average," "Average," "Poor," and "Below Passing."

Our scoring stencil differed most from the theoretical grade distribution and the actual one at Ohio by somewhat smaller percentages for B and C and larger for E and F. Inasmuch as the same stencil was

applied to all students the amounts assigned to each does not essentially matter.

Two groups of students made up of classes in English, History, Biology, Psychology, etc., 475 in one and 563 in another, have furnished estimates. In the first about 50 per cent estimate correctly their later letter grade; in the second but 44 per cent estimate correctly. In the first group somewhat less than 33 per cent over-estimate by one, two or three letter grades their actual grades while about 17 per cent under-estimate their grade by one or more. In the second group of 563 about 37 per cent over-estimate and 19 per cent under-estimate their grade.

Assuming that the grade is the equivalent of a trade-test score, we may conclude that college students do rate themselves as to quality of work with considerably more accuracy than did the 250,000 men trade-tested in the army. Stronger motivation of the latter would be significant probably in any attempted explanation of these differences.

The women exceed the men in under-estimating their grades while the men exceed the women in over-estimating. Both are approximately equal in accurate ratings.

If we determine the median centile rank of the three groups—those who over-estimate, under-estimate, and those whose estimates are correct—we find that as a rule the less able or intelligent over-estimate, the most able under-estimate; the median able are more often accurate. If these self-estimates have any bearing on what these students attempt to achieve particularly in later life, the political, industrial and social significance of our findings may be very great.

Correlations by the rank-order method for some of our groups between the centile ranks, actual grades and estimated grades, range from .695 to practically .00. In classes with frequent and objective tests and with laboratory instruction the correlations tend to be higher, both of ability with actual and with estimated grades. As a rule the actual grades agree a little better with ability than the estimated grades.

### *37. The Socialization of Experience.*

By Martin L. Reymert, Wittenberg College, Springfield, Ohio.

(Author's Abstract).

Preliminary experimentation with about 400 children of the ages 5–15, on the building up of social concepts from symbol visual stimuli, like lines of various widths, angles of varying degrees, etc.

The results suggest several definite lines of growth in socialization of this kind of simple experience, and seem to go well with the theoretical basis for the "Ganzheit-psychologie" of F. Krueger and also with H. L. Hollingworth's system of "Red-integrative Sequence in the Psycho-Physical Continuum."

### *38. Pseudoptics and the Insane.*

By Homer G. Bishop, Wittenberg College, Springfield, Ohio.

(Author's Abstract).

Studies of the insane are generally made from the practical point of view of the law and of society or, by the psychiatrist, as the collapse

of mental faculties. Psychology demands a knowledge of the insane mind as it is. Such knowledge may be obtained by forcing the insane to perceive and record their perceptions. Data taken by direct perception ought to be reliable, if they are of immediate situations. If such perceptual situations furnished opportunity for false interpretations, this feature might make them of more value in testing the perceptual sanity of the insane. Pseudoptical figures meet these requirements.

Interpretations of illusions of length and direction of lines and of form and size of figures, in the Bradley pseudoptical series, were secured, some without difficulty others only by patient but not suggestive persistence, in twelve insane patients. Their interpretations agreed with those of normal individuals. They felt the contradiction between "real" and illusory properties of the figures, which are felt by normal subjects.

These results indicate that insanity need not be at the point of contact with the external world but arises in organization of initial interpretations.

### *39. A Preliminary Report on an Experimental Investigation of the Myer's Learning Curve Equation.*

By Willard L. Valentine, Ohio Wesleyan University, Delaware, Ohio.

(Author's Abstract).

Some psychologists believe that learning is rapid at first, gradually slowing down following some law of diminishing returns, and can be represented by some such mathematical function, as an *hyperbola* (Thurstone). Others believe that learning is slow at first, progressing at an ever increasing rate through an inflection point and then at an ever decreasing rate to a limit. The *arc cot* function gives a good fit to data of this kind (Myer). These two views are not antagonistic; they are complementary (Culler). Where inflection points are not obtained the subjects have previously had equivalent practice in the problem in other connections before they begin formal practice upon the problem at hand. This previous practice should become increasingly less as the subject becomes younger. Data obtained from rats 18, 20, 22 and 24 days old indicate that the inflection point does not exist in simple maze running in the white rat.

### *40. Auditory Discrimination in White Rats.*

By Dorothy Rose Disher, Ohio Wesleyan University, Delaware, Ohio.

(Author's Abstract).

Hunter's work on auditory discrimination shows that the white rat can discriminate between noise and tone, between noise and silence, but not between tone and silence. This experiment was begun because the stimuli in Hunter's experiment were not well defined: hand-claps, buzzer, etc. Hunter verified his own conclusions after plans for this work were begun. We used a simple discrimination box instead of a T-maze, and an audion produced tone. This is not a "pure" tone, certain harmonics being introduced by the telephone receiver. The rat was punished by withholding food when an incorrect choice was made.

The following is a summary of our results:

| *Stimulus* | *No. of Animals* | *No. of Trials* |
|---|---|---|
| 2370 d. v. + silence | 12 | 400 to 600 |
| 3072 d. v. + silence | 10 | 500 |
| 1624 d. v. + 2730 d. v. | 4 | 600 |

Under these conditions the rats failed to discriminate.

When a rat is stimulated with a tone or noise Preyer's ear-muscle reflex is said to be a response (Wada). This reflex could be observed when the rat was stimulated with a loud noise or a loud tone. With the less intense tones used in this experiment the observations were inconclusive. Experiments with the more intense tones have not yet been completed. Should the ear-muscle reflex be evidence that the rat hears, and the rat does not learn the problem of adjusting gross bodily movement to the more intense tone then it will be necessary to restate the fundamental assumption regarding discrimination in animals.

## F. SECTION OF PHYSICAL SCIENCES.

FREDERICK C. BLAKE, Ohio State University, *Vice-President.*

### *41. An Effective Method of Demonstrating Lissajous' Figures.*

By RAY LEE EDWARDS, Miami University, Oxford, Ohio.

(Author's Abstract).

A low-frequency electric oscillator was set up to energize a phonelescope. The pencil of light from the lantern was reflected from the phonelescope to a small mirror on an electrically-driven tuning fork of frequency 128, and thence to the screen. All the common Lissajous' Figures were readily produced by adjusting the condenser controlling the oscillator frequency.

The oscillator obviously should be nearly free from harmonics. A simple oscillator meeting this requirement for the low frequencies used, which can be assembled for the most part from standard laboratory equipment, was described.

### *42. Progress in Practical Meteorology.*

By W. C. DEVEREAUX, U. S. Weather Bureau, Cincinnati, Ohio.

(Author's Abstract).

Just sixty years ago a man came to Cincinnati to take charge of the astronomical observatory, located at that time on the top of Mt. Adams. This man, Professor Cleveland Abbe, appears to have been more interested in meteorology than in astronomy. His work, at that time, in astronomy was soon forgotten; his work in meteorology lives on forever.

Fifty-six years ago the Signal Service of the Army devised a unique system of collecting and distributing weather reports. This system grew and expanded and was known as the circuit system. The weather messages chased each other around and over the country, dropping off a copy here and there as needed. Like the old "Circuit Rider" the system became obsolete.

At 8:00 A. M., April 1, 1928, an entirely new system became effective for collecting and distributing weather reports. The new system uses automatic apparatus, which admits of several channels of communication over a single wire. To accomplish these changes it became necessary to organize a new system for collecting and distributing river reports. At present all river reports made in the Ohio Valley are sent to Cincinnati and from here distributed to other stations, and a similar collecting and distributing center was established at St. Louis for the Mississippi Valley. The changes are the most extensive ever made in meteorological service. It seems quite appropriate today at a meeting of the Ohio Academy of Science in Cincinnati to explain this great progress in practical meteorology as the system of weather telegrams originated in Cincinnati sixty years ago. The first weather map ever published in this country was issued by Professor Abbe on February 2, 1869, at Cincinnati. Detailed weather reports are now sent from all large broadcasting stations, and condensed weather information, including forecasts are broadcast from 160 additional stations. At Cincinnati, complete river bulletins are put on the air each day and these bulletins are copied at dams on the river all the way from Pittsburgh to Cairo. A still newer development is the progress being made in adapting the meteorological service to the needs of aviation. All this service has been started in the last few years.

These are only a few of the things that the Weather Bureau is doing today. I do not have time to mention others. We claim that more progress has been made in developing practical meteorological service during the last few years than was ever before made in a similar period by any meteorological service.

*43. The Postulates and Concepts of the Quantum Theory as Applied to Optical and X-Ray Spectra.*

By S. J. M. Allen, University of Cincinnati, Cincinnati, Ohio.

(Author's Abstract).

Bohr's conception of the quantum theory, applied to the radiation from an excited atom, rests upon two postulates:

(a) That the frequency of radiation is given by $\nu_t = \frac{W}{h}$, where W = the change of energy of the atom between the stationary and excited states, h being Planck's action quantum.

(b) That the energies in the stationary states have discrete values, governed by the quantizing condition that the associated angular momentum can change only by whole numbers of a fundamental quantity $\frac{h}{2\pi}$, i. e. $p = \frac{n\,h}{2\pi}$.

The meaning underlying these postulates appears to a reader as somewhat obscure. Also the action quantum by its dimensions is equivalent to work x time, a somewhat difficult concept in physics. If h is a universal constant, what is the nature of the work and time involved in it?

The following method of considering the problem is given by the author and seeks to furnish some meaning for the processes involved.

We will consider the total radiated negative energy of the atom to bear a definite numerical relation to that of the hydrogen atom (single electron and proton).

Thus, $W = NW_0$, $W_0$—hydrogen energy, and N a number.

Also that the energy is radiated from all orbits in the same time, t secs. Then we have $\frac{W}{t} = \frac{N}{t} W_0$, where $N/t = \nu_t$.

This is due to the condition that all radiated quanta must meet a fixed relation, the fixed velocity of radiation in free space.

$\therefore \nu_t 1 = C$, and $\frac{N}{t} 1 = C$.

For hydrogen $N = 1$, $1 = 911.76\text{Å}$, $C = 2.9998 \times 10^{10}$ cm/sec, whence $W_0 = 2.156 \times 10^{-11}$ ergs, $t = 3.040 \times 10^{-16}$ secs, and $W_0 t = 6.554 \times 10^{-27}$ erg-secs.

In order to fix the energy W to discrete values we make the one assumption

$$N = \frac{Z^2}{n^2}$$

where Z = atomic number, and n the principal quantum number.

Then $W = \frac{Z^2}{n^2} W_0$ (W is the negatived energy).

For a central inverse square force system,

$$W = \frac{Ze^2}{2r}, \text{ where } r = \text{radius vector of the orbit.}$$

$$\therefore r = \frac{n^2}{Z} r_0, \text{ since } W_0 = \frac{e^2}{2r_0}.$$

It follows at once that

$$v = v_0 \frac{Z}{n}, \tau = \frac{n^3}{Z^2} \tau_0, \text{ and } p = np_0$$

Also, $p = \frac{nW_0 \tau_0}{\pi} = \frac{nW_0 t}{2\pi}$

if $t = 2\tau_0$. This is equivalent to Bohr's quantizing condition, viz.,

$$p = \frac{nh}{2\pi} = \frac{n(W_0 \times t)}{2\pi}$$

This seeks to give a meaning ($W_0$ and t) to the somewhat unexpressed meaning in Planck's action h.

Consequently $W_0 t = h$.

The radiation equation follows at once

$$\nu = \frac{W_1 - W_2}{W_0 ct} = \frac{R(W_1 - W_2)}{W_0} = \frac{RZe^2}{2W_0}\left(\frac{1}{r_1} - \frac{1}{r_2}\right) = RZr_0\left(\frac{1}{r_1} - \frac{1}{r_2}\right) = \frac{RZr_0}{r_1} - \frac{RZr_0}{r_2}$$

= Limit term minus sequence term.

In this conception the quantization of the terms may be expressed in terms of a unit radius vector $r_0$, and a quantum number n.

n is a whole number for a hydrogenic term, but not in general, being the same as $(m+\mu)$ in Rydberg's equation.

In any atom of more than one electron the value of n will depend on the negative potential energy of the orbital electron, diminished by the positive potential energy due to the repulsion outwards of the other electrons. Since these actions on account of the relative velocities will not be constant, the orbit of each electron will be a closed curve (circle or ellipse) having superimposed on it a fluctuating perturbation of a peculiar periodic character. The actual measured n in spectroscopic work will be an average value, and not a whole number.

The author discussed the optical spectra of neutral helium, lithium and the K absorption limits in X Rays, and showed that these latter apparently showed a Moseley diagram for isoelectronic systems (normal) which instead of being a straight line is a series of straight lines of different slopes, occurring at definite values of Z, where new groups are formed, such as, $Z=3$, $Z=11$, $Z=19$, etc.

### *44. Dr. Hendrik Antoon Lorentz: A Tribute.*

By Maximilian Braam, 3449 Lyleburn Place, Cincinnati, Ohio.

(Author's Abstract).

Dr. Hendrick Antoon Lorentz was born in 1853, in the city of Haarlem, the Netherlands. Early in life, he became interested in Mathematics and Natural Science, and even then, he showed marked ability in these fields. While he was still in the secondary school, he pointed out that "The Law of Snell, (Snellius)" could be derived from 'The Principle of Huyghens.' "

At the age of 19 when he had finished his undergraduate studies, he began teaching in the Evening High School, in Haarlem, his home city, while at the same time he pursued his studies for the doctor's degree.

Three years after he had taken his degree at the University of Leiden, he received the appointment of that university as Professor of Natural Science, he being, at that time, in his 25th year. In the course of time, he developed and formulated the theory of electrons and thereby prepared the way for the theory of relativity as developed by Einstein. In 1903, Lorentz, with Dr. P. Zeeman of the municipal University of Amsterdam, was awarded the Nobel Prize.

In 1912, having accepted the appointment as curator of the Teyler Laboratory for Research, at Haarlem, he remained connected with the University of Leiden as Professor Extraordinary.

The activities of Dr. Lorentz were not confined to the University of Leiden, nor to his country. He accepted many invitations to lecture in foreign countries. In Germany, he lectured at the University of Tuebingen; in France, at the Sorbonne; in England, at Cambridge, and in the United States at most of the greater universities.

On the 4th day of February, of this year, Dr. Lorentz, ripe in years, and rich in honors, with the calmness and fortitude of wisdom passed

from among the living. Many representatives of foreign universities were present at the funeral. Among them may be mentioned, Madame Curie and Dr. Langevin from Paris; Dr. Rutherford from Cambridge, and Dr. Einstein from Berlin.

The works of Dr. Lorentz have been translated into many foreign languages, even into Japanese.

### *45. The Structure of Space and Matter*

By Dr. R. M. Manley, Cleveland, Ohio.

(Author's Abstract).

Space is postulated as repellent points tending to move in straight lines in every direction with light-velocity, and matter as whorls of similar monads interfering with special movements. Hypothetical models illustrate the dynamic principles involved in the electron, proton, hydrogen and helium atoms congruent with principles required by Bohr's atom, the quantum theory, equivalence of mass and energy and relativity. Definitions assumed for space and matter demand light-velocity propagation of gravitational force; this, in turn, necessitates a variation in the action of gravitational force not hitherto emphasized, e. g., two bodies moving tandem fashion along the same path do not have like gravitational influences upon each other, the forward body exerting the greater influence; when considering intra-atomic particles moving at high velocities, this becomes a powerful factor capable of harmonizing many otherwise paradoxical phenomena and theories.

### *46. Basal Metabolism and Menstruation*

By Charles G. Rogers and Joan Flemming, Oberlin College, Oberlin, O.

(Authors' Abstract)

In this paper, there is a general discussion of basal metabolism, followed by a discussion of the literature on the special phase of basal metabolism and menstruation. The relation between some of the endocrine glands and the menstrual cycle, with particular emphasis laid on the thyroid, is included.

The data from experiments on seven normal women, one non-menstruating woman, and one man are shown in graphs and tables. The graphs show the daily records and the averages for the four arbitary periods of the menstrual cycle. The tables show the pulse, respiration, and basal metabolic records in calories and percentages plus or minus, the sub-Dubois and the Harris-Benedict standards for each of the 103 tests and each subject's average for the periods of the month. The standard deviations and probable errors were calculated.

The results seem to show evidences of a relation between the basal metabolic rate and the menstrual cycle with the lowest point in the metabolic cycle coming during or immediately following the menstrual period. Evidence seems to be present also indicating a corresponding change in pulse and respiration rates. The non-menstruating subject showed very little change in basal metabolism and the man showed change but of a different kind.

### *47. Medical and Public Health Work in a Large Coal Company.*

By Dr. D. J. Kindel, Fairmont, West Virginia.

(Author's Abstract).

The subject of this paper deals with the public health and medical work as carried on in industry by a large coal mining company.

The author points out that the company employed approximately fourteen thousand men located at their various operations in four different states.

Complete medical attention is given all employes and their families, a total aggregate number of people amounting to approximately sixty thousand.

To provide this service a staff of approximately thirty doctors, thirteen public health nurses, five dentists and a fifty bed hospital with a nursing staff is maintained.

It was brought out that the company is attempting to provide the best and most modern medical and nursing service for their employes and in order to do this the physicians and nurses care for no one but company employes.

The nursing activities were given briefly as follows: School Health Work, Health Study Classes and Groups, Clinics, Instructional House Visits, Immunizations against Typhoid Fever, etc., Tuberculosis Program, Correction of Defects, Elimination of Insanitary Conditions, Parent-Teacher Organization Activities, Social Work, Sanitary Surveys.

It was pointed out that the program was just beginning, scarcely a year old, and was begun by a sanitary survey including all the properties of the company.

In one division where typhoid fever was especially prevalent, thirty thousand typhoid inoculations had recently been given. The effect on the typhoid rate in the future is to be carefully watched.

A number of photographs were displayed illustrating the modern advancement in office equipment, health study clubs, clinic groups, etc.